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The work aims at throwing light on the genesis of nationalistic ideology in the days of freedom struggle so that it becomes easier for the present generation to understand it's true spirit.

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CHAPTER-1

INDIAN ENGLISH LITERA TURE WITH FREEDOM STRUGGLE AS BACKGROUND

"Tagore's broader idea of nationalism in terms of spiritualism and anti-colonialism"

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ABSTRACT

During the days of freedom struggle several men of letters produced creative works which inspired nationalism and patriotism among people. The paper aims to examine the Tagore's broader idea of nationalism in terms of spiritualism and anti-colonialism.

The powerful patriotic spirit of Tagore's literary works brought him in the mainstream of the freedom struggle and earned him national wisdom. He not only gave importance on political freedom but also spiritual freedom. Tagore in his poem, "where the mind is without fear" writes:-

Where the mind is led by thee into ever-widening. Thought and action into that heaven of freedom. My father, let my country awake.

His works generated a spirit of liberating India from colonialism. He was on a poetic mission to save India from slavery. His works ignited passion and united people to dedicate them to the national struggle. He opposed the partition of Bengal along communal lines

and hated the idea of division of his beloved state. He advocated for Swadeshi, composed soul – stirring songs, addressed meetings and led protest marches.

Tagore suggested the people of country to get freedom on humanitarian grounds. "It is my conviction that my countrymen will truly gain their India by fighting against the education which teaches them that a country is greater than the ideals of humanity". He opposed the ideas of nationalism initiated from West.

Tagore gifted to India her national anthem. The song generated a sense of national unity during the days of freedom struggle which made India stronger than before. He was a seer and national builder and his contribution of his songs to the national freedom was immense.

Key Words: nationalism, patriotism, spiritualism, colonialism, freedom

"Tagore's broader idea of nationalism in terms of spiritualism and anti-colonialism"

Rabindranath Tagore (1861-1941), popularly known as Gurudev, expressed his views on Indian nationalism on various occasions. A collection of his speeches on nationalism was published in 1917 with the same title and one of the speeches in it denotes Tagore's unconventional, integrated views on Indian nationalism. A substance of his deliberation is that the true spirit of nationalism lies in its broad humanistic concern rather constrained political strategy. The spread of fanatic nationalism during the First World War might have forced him to interpret and blame it as an evil epidemic. He was trying to subvert the popular idea of nationalism which was more a political justification that encouraged grabbing other nations and their resources. Rabindranath Tagore was a versatile genius, a true nationalist and above all an indisputable humanist who has been inspiring generations of intellectual and empathetic minds irrespective of their religion, race, language and also the barriers such as state and nation. The literary and artistic genius of Tagore, which spanned over six decades, is nothing but a reflection of a sensitive artist, a sympathetic man of letters,

a profound thinker and a strategic experimentalist. It may be considered a false promise if someone assures to introduce in brief his all-encompassing intellectual engagements; therefore, the author of this article assures his readers an introduction of Tagore's thought-provoking perception on Indian nationalism focusing the very soul of his intellectual deliberation.

Tagore's perception of nationalism has mainly relied on ancient Indian philosophy, where the world was accepted as a single nest. In this way, Tagore was striving to dissociate himself from the general belief of nationalism and trying to associate it with ideas such as peace, harmony and welfare. He argues further that if anyway India decides to contribute the world; it should be only in the form of humanity.

Humanity, world over does not require a narrow but broad sense of nationalism. Therefore, it should be formulated through various means of life. Tagore's idea of humanism goes beyond any boundaries or barriers and seeks at large a common place where humanity comes before any other kind of identity. He adds further that the saints such as Nanak, Kabir, Chaitanya ignited the flame of humanism in Indian minds. But unfortunately, it was faded over time with an aggressive rise of racism and caste-based disintegration of our society.

The ideas like purity and impurity of race have massacred millions over centuries. Even two World Wars and other racial conflicts were provoked based on the false notions of superiority. Nothing as such has really existed in this world where men and women can be straightway divided and disintegrated. Therefore, his belief: *'Only those peoples have survived and achieved civilisation who have this spirit of co-operation strong in them'* receives a cardinal significance. At large, human beings all over the world should be glanced only through the mirror of co-operation and humanity.

Tagore considered that apart from political freedom, the freedom of mind is more important. The Euro-centric notions of freedom have forced us to consider political freedom as an ultimate destination in the journey of the freedom movement in our country. Blind faith in

Europe will instead increase our greed for possession. Hence, we should give up this narrowness and be more comprehensive in our inward and outward expressions that extend freedom of mind. Ultimately, this freedom of mind finds harmony with the human soul and at large human life. He also believed that there is only one history, i.e. history of man and other histories are mere chapters in the larger one.

Nations with spiritual integration, love, and sympathy for others may find a permanent place in any age. Thus, Indian nationalism or nationalism of any kind is nothing but a mixture of integrated ideals of humanity and human welfare. It should be a tenable progression that outsets within.

The world politics today indicates its growing narrowness in the form of mounting significance given to the politics of dominance and also to the theory of division. Tagore's views on nationalism are much ahead of time and should reach the masses.

The postcolonial discourse in India has made many attempts to appropriate Tagore within its fold, and it is not that its arguments are weak. We can take two of Tagore's famous novels The Home and the World (1916) and Four Chapters (1934), which are set against the backdrop of political upheavals, for the purpose of examining this point. The protagonists from both the novels—represented by Nikhil, Bimala, Sandip (from The Home and the World) and Indranath, Ela, and Atin (from Four Chapters)—embody the happenings that took place during their subjugation by the British colonisers, amidst the Indian freedom struggle. The main focus in both the novels is on the discourse encompassing cultural, political, social, and economic issues which reflect the mindset of the people during those times. The novels clearly depict the British colonisation of India, the bold rejection of subjugation by the protagonists, and the reasons for doing so. Thus, the need for self-identity and recognition was beginning to take root in the heart and soul of the people of India at that time. Tagore's initiative to instil self-worth into a colonised people is portrayed through his novels (Ebenezer 2005).

But, surely, Tagore cannot be appropriated by a single discourse, let alone by postcolonialism. His works, when keenly examined, transcend postcolonial thinking. Michael Collins in his 2011 book, Empire, Nationalism and the Postcolonial World: Rabindranath Tagore's Writings on History, Politics and Society, argues that postcolonial historiography has not accorded Tagore the intellectual standing he deserves. His book strives to explain, on the one hand, why "Tagore has been consistently misunderstood, misrepresented, sometimes ignored, and in many respects diminished as a writer and thinker" (Collins 2011: 1). On the other hand, it attempts to locate more precisely Tagore's importance for historians, political scientists, and theorists of modernity, postmodernity, and postcolonialism alike. It does so by laying out Tagore's "distinctively universalist philosophy," presented as a critique of certain aspects of modernity, and as an alternative to both empire and nation. On the other hand, Collins (2011) claims that "Tagore can help us better understand some of the failures of postcolonial theory."

The Perils of Nationalism and the Merits of Cosmopolitanism

Tagore does not engage in an outright denunciation of the West, but acknowledges its good aspects (Tagore and Dasgupta 2009). He does not indulge in mirrored reactions; that is to denigrate the Western culture in return for their denigration of ours, the non-Western. Apparently, this appears to be a trend of postcolonialism in its attempt to reassert the self (the East). In contrast, Tagore attempts to draw an overarching bridge between the East and the West. He engages in an attempt to find harmony and unity in its true essence, a call to be one with "the infinite."[1] We can observe this in his novel The Home and the World. His conception of internationalism—located in the interactions between colonial and postcolonial, East and West, tradition and modernity—contains the seeds of cosmopolitanism, as he perceives colonialism as a two-way process.

Taking the context of British colonialism in India, he observes that colonialism steers nationalism into becoming imperialistic. He was

concerned about anti-colonial resistance in India which morphed into chauvinistic nationalism, which has been the characteristic of Western nationalism. For instance, referring to the burning of "foreign" goods by Indian nationalist leaders, during the freedom struggle, he said such acts were not only self-defeating, but also a mere imitation of Western nationalism.

However, on the other hand, Tagore believed that colonialism presented a chance through which the West came to be experienced by India, and thereby, introduced a channel of learning and exchange. Tagore argues that certain extreme forms of nationalism, espoused and used in India's struggle for independence, are ultimately self-defeating, and perceives nationalism as a purely Western construct, warning against the extreme frenzy of nationalism. For him, independence lay both in denunciation of imperialism and the retention of the channel of learning and exchange. It is in Tagore's ability to accommodate such contrasting viewpoints does one finds the roots of cosmopolitanism (Dharmani et al 2015).

"If Tagore were to see the India of today, more than half a century after independence, nothing perhaps would shock him so much as the continued illiteracy of the masses. He would see this as a total betrayal of what the nationalist leaders had promised during the struggle for independence—a promise that had figured even in Nehru's rousing speech on the eve of independence in August 1947 (on India's "tryst with destiny") … Rabindranath would be shocked by the growth of cultural separatism in India, as elsewhere. The 'openness' that he valued so much is certainly under great strain right now —in many countries. Religious fundamentalism still has a relatively small following in India; but various factions seem to be doing their best to increase their numbers. Certainly, religious sectarianism has had much success in some parts of India (particularly in the west and the north). Tagore would see the expansion of religious sectarianism as being closely associated with an artificially separatist view of culture." (Sen 2001)

Such occurrences are against Tagore's notion of "the infinite." In essence, they are simply articulations of forced unity and not harmony.

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Chapter-2

Indian Writing In English During Pre Independence And Post Independence Period

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The main theme of the current magazine, entitled "History of English Literature in India before Independence: It is considered fundamental. It addresses the different parts of the books when freedom. There has also been an attempt to connote the books of Mulk Raj Anand, Raja Rao and Manohar Malgonkar as a true Indian ostracism The title proposal is a humble attempt to discover the excellent work done by the prominent authors MRAnand, Raja Rao and Manohar Malgonkar in Indian writing in English. With this in mind, the purpose of this research is to review his modified strategies used to convey perspective on life. It also reflects the particular highlights of his books and the representative importance of anecdotal work, temperament, tone, and special methodology used in describing Indian English today. To show how English writing began in India before 1920 and how it was created in India, we first saw it in Section I, entitled Introduction. In an article entitled "History of Indian English Literature", do you present the revival of Indian writing? The reformers for example Aurobindo, Rammohan Roy, etc. And his commitment to the development of the Renaissance. The impact of writing in English in India is also discussed in depth in this article.

In 1857, the clear calm of the Indian subcontinent was shaken by the revolt of a modest group of Indian fighters at Meerut. The revolt immediately spread to Delhi, where the Maverick soldiers sent the incapacitated Mughal emperors as their leader. The Indian mutiny lasted a few months. The last obstacles were finally removed in 1859, but not before two new names were inevitably etched in the minds of the British country : Lucknow and Cawnpore, the first equivalent of British mental strength, and the second, The Deserter. Indian. Dishonesty. In fact, there are still conflicts today over the scope and direction of the uprising. The reasons for the riot can remain the subject of controversy and conjecture forever. The effects of the mutiny were seen in all the resulting relations between the Indians and the British. Even when British forces in India demanded a gruesome tool of revenge, the London authorities were quick to urge that steps be taken to ensure that this revolt never happened again. The administration of the Indian Law of 1858 displaced the rest of the East. The Indian Company was pressing for the crown and around the same time a royal decree changed the course of the British settlement in India. Therefore, there was no further expansion of the Indian kingdoms, there was no more westernization of Indian culture or culture.

Indian writing is consistently seen and recognized as one of the most established scripts in the world through its myriad of legends and stories from ancient times. India has 22 officially licensed dialects and a titanic range of scripts has been created and reproduced in these dialects. As known in the history of ancient India. Hinduism was the most dominant strict group still ruling in pre-Christian times and evoked lasting impressions of the plight of scholars.

The customs of Hindu scholars have engulfed a significant part of Indian culture (including the Upanishads, Samhitas), Brahmins and Aranyakas, The history of Indian writing is performed on a healthy space by Hindu epics like the Ramayana and compositions of the Mahabharata, for example, Vaastu Shastra in planning and urbanism and Arthashastra of Kautilya (also seen as Chanakya) that provides political theory and contribution to legislation. Family affairs in ancient

India. Ancient and impressive Hindu verses, plays and arias radiate the subcontinent with an almost peculiar symbolism that can be seen in the continuing development of writing in IndiaThe Bhakti movement in general has been responsible for a particular break with the old "golden momentsKalidasa and Tulsidas (incredibly reliant on the Ramayana for their epic Hindi sonnet called Raamcharitmaanas) are among the most popular works. By keeping, Rabindranath Tagore, a foundation, without the help of anyone else, had won the first Indian Nobel Prize for his excellent work on Gitanjali.. One thing we have been incredibly pleased with so far, the India Director of Studies scholarship, the " Jnanpith " stock market, has been offered time and again to Bengali authors, demonstrating the richness of Bengali writingThe history of Indo-English writing edifies readers that the first Sake Dean Mahomet book ever written by an Indian was called The Travels of Dean Mahornet ; The pass trip Muhammad was distributed in England in 1793.

The authors of the original Indo angliani have significant abstract legitimacy; Most of the books of this period, sometimes even at some point, exceed the level of mediocrism that has developed everywhere. Indian artistic revival was spurred by the effect of the write English. Indian scholar who tried to communicate in English, they were fascinated by early Victorian models when they tried to copy their own works. The history of Indo Anglian started as a wandering child, which means wading, but he tried to imitate the elderly and had a lot of energy to learn and improve. Books on early Victorian era models : In fact, the early Indo angliani books were imitations of early Victorian authors, and we should know that two of the Indo angliani books that were distributed during this period were all La proof of this period are the stories of preferences and seasons of the past that are of little interest to the reader today. These writers Indo angliani not been considered or seriously evaluated at that time. "As the specialty of another era, it is necessary to some extent to enter the mind, recognize its missions and obtain the will to accept certain situations that are eccentric in one's values." (1) The early journalists, and mainly the South Indian scholars, are known to the British Raj and "their language

is adapted from English and Victorian operas or romantics." The recorded books from this period also show Sir Walter Scott's undeniable influence on both structure and structure. Written in the 19th century and in the first twenty years of the 20th century there was little inventive effort. Social injustice praised the adorable characteristics of Indian femininity and represented life in the Indian countryside.

Indian writing in the English language and its actual development had come very close to the consolidation of British rule in India. However, there are "a number of reviews of important Indian content that are conclusive in English, although experts believe that Indian writing experiences in India date back to at least the mid-19th century. Its beginnings had been catalyzed by three sources: school changes by the British government, ministerial efforts, and the reaction and recognition of the English language and script by privileged Indians. The main recorded view of Anglo-Indian writing is an attempt to contextualize the development and emergence of this classification from its origin to its current dimension. First, there were the information reformers required by the Treaty Act of 1813 and the English Education Act of 1835 by William Bentick. In an attempt to correct and compensate for some of the materialistic and greedy and therefore bargaining practices of the East India Company workers, the English Parliament had passed the Statutes Act which held England responsible for revealing the improvement of the population.

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She is diligent at work with a vision to provide holistic education. Being an ardent reader band critic of literature she believes that literature has a great influence on both individuals and society and it can inculcate great qualities like leadership in the individuals. Leadership is not about glorious crowning acts. It's about keeping your team focused on a goal and motivated to do their best to achieve it, especially when the stakes are high and the consequences really matter. It is about laying the groundwork for others' success, and then standing back and letting them shine. This idea is the driving force behind this compilation.

The work aims at throwing light on the genesis of nationalistic ideology in the days of freedom struggle so that it becomes easier for the present generation to understand it's true spirit.

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Chapter-20

Literary work with Religion as a Powerful tool to raise the people against colonial rulers

Roja Masanam

The Indian society, which you see in 2012, is very different from the one in the first half of the 19th century. Two major social causes prevented the society's progress. These were lack of education and subordination of women. Many sections of the Indian society were rigid and followed certain practices which were not in keeping with humanitarian values.

Lack of Education

Majority of people in those days were illiterate. All over the world education was in the hands of a very small number of people. In India also, education was limited to a handful of men belonging to the upper castes. Brahmins in India had access to the Vedas which were written in Sanskrit. It was a language known only to them. Religious texts were also controlled by these people. So they interpreted them in a way that benefitted them. Expensive rituals, sacrifices and practices after birth or death were outlined by this priestly class. It was mandatory

for everyone to perform these rituals in the belief of a better life after death. Nobody could question the Brahmin priests because nobody knew what was written in the scriptures. Similarly in Europe, the Bible was written in Latin. It was the language of the Church and their priests interpreted the religious texts accordingly. And that is why, as a reaction, Europe saw the Renaissance and the Reformation Movement about which you have read earlier in this book. Even ideas like liberty, equality, freedom and human rights were introduced in Europe by various revolutions which took place there.

Position of Women

Girls and women today have better opportunities for their development. They have more freedom to study and work outside of home. However, way back in the 19th century the life was much harder for majority of the women. Certain social practices like female infanticide, child marriage, sati pratha and polygamy were prevalent in some sections of Indian society. Female infanticide or killing of a girl child was a very common practice. Girls who survived were often married at a very young age and often to men who were much older. Polygamy, a practice of a man having more than one wife was an accepted norm among many castes and religion. In some parts of the country Sati Pratha was practiced in which a widowed woman was compelled to burn herself on the funeral pyre of her husband. Those women who could escape the practice of Sati had to live a very miserable life. Women had no right to property. They also had no access to education. Thus, in general, women had a subordinate position in the society. The fear of the invader and loss of family honor was one reason.

Socio –Religious awakening

Reformers like Raja Rammohan Roy, Ishwarchandra Vidyasagar, Swami Dayanand Saraswati, Jyotiba Phule, Sir Syed Ahmed Khan

and Pandita Ramabai understood that ignorance and backwardness in the society was responsible for hindering its progress and development. This realisation was reinforced when they came in contact with the Europeans and found that life was very different in other parts of the world. When the British missionaries started spreading Christianity, they criticized and questioned many of our social and religious practices. Many of their ideas were accepted by our reformers. The desire to reform the society was so strong that these reformers were now ready to face challenges as well as resistance from the orthodox Indians. They started several movements to bring desirable changes in the society.

The Caste System

Since ancient times, Indian society had a caste system which was originally occupation based. Over a period of time, interpretation of religious texts by the upper caste and lack of access to religious scriptures by the lower caste led to several superstitious practices in the name of religion. This also resulted in power being concentrated in upper caste and exploitation of the lower caste

Hindu society was based on the Varna system, that is, Brahmin, Kshatriya, Vaishya and Shudra. According to this system people were divided on the basis of their occupation. The people who were engaged in praying and worshipping the Gods were categorized as Brahmins. The people who were engaged in wars were called Kshatriyas. Those whose occupation was agriculture and trading were known as Vaishyas and those who used to serve the upper three Varnas were known as Shudras. This caste system, which was purely based on occupation, had become hereditary. A person born in a particular caste could not change his/ her caste even though they might have changed their work. This created inequality in society. It also led to the exploitation of the lower castes. Therefore, caste system had became a major hindrance.

The Prevalent Religious Practices

Most of the social practices were done in the name of religion. Hence, social reform had no meaning without religious reform. Our reformers were deeply rooted in Indian tradition and philosophy and had a sound knowledge of the scriptures. They were able to blend positive Indian values with western ideas and the principles of democracy and equality. On the basis of this understanding, they challenged the rigidity and superstitious practices in religion. They cited the scriptures to show that the practices prevalent during nineteenth century find no sanction in them. The enlightened and the rationalistic amongst them questioned the popular religion which was full of superstitions and was exploited by the corrupt priests. The reformers wanted society to accept the rational and scientific approach. They also believed in the principle of human dignity and social equality of all men and women.

SOCIO RELIGIOUS REFORMERS OF THE 19TH CENTURY

Raja Ram Mohan Roy was born in a Brahmin family of Bengal. He knew many languages and had read Quran, Bible and the New Testament along with Hindu scriptures in great depth. Liberal education exposed him to different cultures and philosophies. Deeply moved by the plight of his brother's widow, who had been forced to commit Sati, he was determined to uproot this social practice. This led him to challenge other unfair social and religious practices prevalent at that time. He founded Brahmo Samaj in 1828. He was the first person to take an initiative to challenge the practice of Sati and it soon became his life long crusade .

Ishwar Chandra Vidyasagar

A great scholar and reformer, Ishwar Chandra Vidyasagar dedicated his entire life to the cause of social reforms. The first Hindu

Widow Remarriage Act was introduced in 1856 owing to his relentless efforts. He also protested against child-marriage and campaigned against polygamy. Though he did not concern himself much with religious questions, he was against all those who opposed reforms in the name of religion.

Though he was a Sanskrit scholar, his mind was open to the best in Western thought. His major contribution was in the field of education. He encouraged the study of Sanskrit and Bengali literature. He also introduced the study of Western thought in the Sanskrit college to inspire the Indians to shake off their age-old beliefs and modernize their ideas. He believed that condition of women could be improved only through their education. His efforts in this direction were praise worthy. He helped in opening approximately 35 girls' school in Bengal. He was a champion of women's education. The admission of non-Brahmin students in the Sanskrit College was made possible through his efforts.

Swami Dayanand Saraswati

The Arya Samaj founded by Swami Dayanand Saraswati in 1875 undertook the task of reforming Hindu religion in North India. He considered Vedas to be infallible andthe foundation of all knowledge. He rejected all those religious thoughts which were in conflict with the Vedas. He believed that every person had the right to have direct access to God. It started the Shuddhi Movement to bring back those Hindus who had converted to Islam and Christianity. Satyarth Prakash was his most important book.

Arya Samaj advocated social reform and worked to improve the condition of women. It fought untouchability and the rigidities of the hereditary caste system and promoted social equality. The use of Hindi language in which he wrote and preached made his ideas accessible to the people of Northern India. Arya Samaj also had a

major role to play in the national movement as it inculcated a spirit of self respect and self reliance among the people. The role of Arya Samaj was commendable in promoting education among the masses. Some of Swami Dayanand's followers later started a network of schools and colleges called D.A.V. (Dayanand Anglo Vedic) in the country to impart education on western lines without compromising on the Vedic teachings. They encouraged teaching of English and modern science along with Sanskrit and Vedic education.

Ramakrishna Paramhansa and Swami Vivekananda

Paramhansa (1836-1886) highlighted the essential unity of religions and the need to lead a spiritual life. He believed that the different religions of the world are only different ways to reach the same god. Swami Vivekananda (1863-1902) was his foremost disciple.

Vivekananda was the first spiritual leader who thought beyond religious reforms. He felt that Indian masses needed secular as well as spiritual knowledge to empower them to believe in themselves. Vivekananda established the Ramakrishna mission after the name of his guru Ramakrishna Paramhansa. Through his speeches and writings, he brought out the essence of Hindu culture and religion. He believed in the spirit of Vedanta and the essential unity and equality of all religions. He laid stress on the removal of religious superstitions, obscurantism, and outdated social customs. He tried to remove caste rigidities, and untouchability. He motivated the people to respect women while he himself worked for women's upliftment and education. Vivekananda attached primary importance to the removal of ignorance among the people.

Sir Syed Ahmed Khan

Sir Syed Ahmed Khan believed that the religious and social life of the Muslims could be improved only by imbibing modern western

scientific knowledge and culture. His major concern was the removal of social and educational backwardness among the Muslims. He worked hard to raise the status of the Muslim women. He was againstthe purdah system, polygamy, easy divorce and lack of education among the girls. Though he was opposed by the orthodox Muslims, he made commendable efforts in promote women's education. He tried to interpret the Quran in the light of reason and spoke out against fanaticism and ignorance. He also initiated social reforms for the upliftment of Muslim society. Throughout his early life, he advocated the study of English language even against the opposition of the orthodox Muslims. He considered that only modern education could lead Muslims towards progress. He established an English school in Ghazipur (present day Uttar Pradesh) in 1864. He started the Mohammadan Anglo-Oriental College (M.A.O.) at Aligarh in 1875 which later developed into the Aligarh Muslim University. It provided education in humanities and science through English medium. He also established a scientific society for translating English books. He also published a journal for spreading awareness among the Muslims towards social reforms especially towards modern education. He started the Mohammadan educational conference for spreading liberal ideas among the Muslims. The movement for reform started by him is known as the Aligarh Movement which proved to be an important step towards social and political awakening among the Muslims.

Jyotirao Govindrao Phule

Jyotirao Govindrao Phule from Maharashtra worked to attain equal rights for peasants and the lower caste. He and his wife, Savitribai Phule, are most known for their efforts to educate women and the lower castes as well as the masses. He first educated his wife, after which both of them opened a school for girls in Indiain August 1848.took up the cause of women and started a girls' school in Poona

(Pune) in 1851. He is also remembered for his efforts towards promoting widow remarriage. In September 1873, Jyotirao along with his followers formed the Satya Shodhak Samaj (Society of Seekers of Truth) with the main objective of liberating the lower castes and protecting them from exploitation and atrocities. He waspopularly known as Jyotiba.

Justice Mahadev Govind Ranade

Justice Mahadev Govind Ranade established the Poona Sarvajanik Sabha and the Prarthana Samaj in 1867 in Bombay to bring about religious reforms. It sought to remove caste restrictions, abolish child marriage, the shaving of widows' heads, the heavy cost of marriages and other social functions; encourage education of women and promote widow remarriage. Like Bramho Samaj, it advocated the worship of one God. It condemned idolatry and the domination of the priestly castes in religious matters. He introduced vernacular languages in the University curriculum which made higher education accessible to Indians. He attempted to reform the rigid traditions in the society without destroying the social atmosphere of India's rich cultural heritage. He was also a founding member of the Indian National Congress.

Pandita Ramabai In Maharashtra

, Pandita Ramabai, a renowned social reformer, fought for the rights of women and spoke against the practice of child marriage. She promoted girlseducation and started the Arya Mahila Samaj in1881, in Pune, to improve the condition of women, especially child widows. In 1889, she established the Mukti Mission, in Pune, a refuge for young widows who had been deserted and abused by their families. She also started Sharda Sadan which provided housing, education, vocational training and medical services to widows, orphans and the visually challenged. She also wrote many books showing the hard life of women, including child brides and child widows. The Pandita Ramabai Mukti Mission is still active today.

Annie Besant

Annie Besant was a member of the Theosophical Society and came to India for the first time in 1893. This movement was led by Westerners who glorified Indian religious and philosophical traditions and encouraged vernacular languages and literary works to instill a sense of pride in Indian heritage and culture. It aroused political awakening and helped Indians recover their self-confidence and get a sense of pride in their own country. The society also preached the universal brotherhood of man. It made immense contribution towards the development of Modern India. Annie Besant became the President of the Theosophical Society in 1907. Besant opened a college for boys, the Central Hindu College at Banaras based on Theosophical principles with the aim to build a new leadership for India. The students studied religious texts along with modern science. The college became a part of the new University, the Banaras Hindu University from 1917.

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Chapter: 6

GANDHIJI IDEAS ON SOCIAL DEVELOPMENT IN INDIA

Dr. D. Rajya Lakshmi

I. Introduction: Social Development is concerned more with scientific study of the development of human society or the development of mans social life. Since man is a social being and mutually acts and reacts with one another, study of the nature of this relationship is important. Infact, everything man does has some sociological implications, because all the activities, religious, economic, scientific, educational etc are performed in society and in their turn influence it in some way or the other (Zatlin Irving-1987). Aristotle was fully aware of man's intimate relationship with society, which prompted him to say that "Man is a Social Animal". Hence in this background the present paper is to analyze the Social development ideas of Mahatma Gandhi .This paper is purely based on secondary data, the main sources of information regarding economic thoughts of Mahatma Gandhi from various sources of Indian scholars.

II. Biographical Sketch of M.K. Gandhi (1869-1948): Mohandas Karamchand Gandhi was born on 2nd October, 1869 at Porbander. In 1887, he went to England for education in Law, and was called to the bar in 1891. From 1893 to 1914 Gandhiji rendered great service to the cause of social equality in South Africa. He served the people of South Africa for two decades and came back to India in 1915 and assumed the political leadership of the country. He was shot dead by an extremist who did not agree with his views, on January 30, 1948. The great has been the influence of Gandhian ideology that the period from 1920 to 1948 was called the Gandhian era. His ideas was influenced and shaped by the philosophy of Tolstoy, Tustain, Thoreau, Kropotkin, Kabir Nanak and of Hindu scriptures like Upanishads and Gita. Gandhi's economic

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philosophy is based on the well-being of the individual, social justice, non-violence and ultimately self realization of man as a central metaphysical norm.

III. Social development concept-Mahatma Gandhi: The term social development may seem a very idealistic in itself but it is very complex and more difficult to achieve. Social development is about improving the well being of every individual in society so they can reach their full potential. Gandhi's basic aim was to have an all-round development of the society that included human development along with socio-economic-political development. He wanted freedom and equality for all. His ultimate goal was Sarvodaya (the development of all in all facts of life). The concept of Sarvodaya pre supposes the principles, of justice Sarvodaya generates movement after changes out ward as well as inward and strives for egalitarian social order based on truth nonviolence and purity. For Gandhi, villages formed the foundation of Indian Society and therefore he supported the idea of self rule, governance at the local levels. Decentralization was his mantra for achieving equality and development. His emphasis on decentralization, community based economics, self sufficiency, handicrafts, rural development and use of low capital intensive appropriate technology indicate his vision for a self sufficient economy. "Earth provides enough to satisfy every man's needs, but not even one man's greed". This statement was given by Gandhiji himself as he always oppose the exploitation, he emphasized on equal distribution of resources. Gandhi has tried to explain the concept of Swaraj or home rule from the point of view of non-violence or love. He has bitterly criticized many of the things associated with modern (western) civilization. For example, he has attacked railways hospitals, doctors, lawyers, machines etc, as things that are not only useless but also positively harmful. (M.K.Gandhi-1962)

A civilized or modern society is becoming rigid day by day. The state of unauthentic existence of man and his impersonal elements have however proved inimical and antithetical to his basic individuality. The speedy automization of modern mechanized society is fast resulting in de-individualization and de-humanization of man in modern times. As a result there is an economic and social exploitation. (Reddy.V.N.K-1963). Gandhiji's objection to modern civilization is based on the ground that it takes note neither of morality nor of religion. (Gandhi M.K.-1962). As one knows, Gandhi's entire outlook is based on moral principles, man is essentially a spiritual entity, although the human body is a material things. Since civilization means progress, the test of a civilization should be in its ability to facilitate spiritual progress. A true civilization should help man to progress morally, not materially. A civilization that caters to only material comforts and conveniences and leads man away from the path of righteousness is a false one. It is like intoxicating liquor which temporarily creates a false sense of well-being and happiness, but is infact, harmful dangerous. (Devadoss. T.S.-1983)

V. Gandhian Philosophy of Rural Development: Gandhi is regarded as the first social thinker in India who presented a complete picture of an ideal Indian society based on rural qualities, giving thought to every aspect, such as nature of the state and its administration, defense, health, sanitation housing, education, unemployment, development of weaker

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sections and eradication of various social problems such as untouchability, alcoholism, poverty etc. It is interesting to note that Gandhi used the word Grama Swaraj with a double meaning in the context of Indian National Movement. Gandhi promoted in the concept of Swaraj or self rule, advocating Indian Independence from foreign domination. Simultaneously, he also discussed his belief in Gram Swaraj (village self rule) asserting that the Indian village should be self sufficient and autonomous.

Gandhi's idea on village republic is bold and comprehensive. According to Gandhi, Village Panchayats should have full powers and little interference from the state. Emphasizing on autonomous village republic is the way to promote participatory model of rural development "Independence must begin at the bottom. Thus, every village will be a republic or panchayat having full powers (Harijan, 4-1-1948, p.500) rural prosperity begins with the formation of all powerful village panchayat that would self-impose the rules and regulations for self-reliance and sustainable development. Rural development which is concerned with economic growth and social justice, improvement in the living standards of the rural people by providing adequate and quality social services and minimum basic needs becomes essential. The present strategy of rural development mainly focuses on poverty alleviation, better livelihood opportunities, provision of basic amenities and infrastructure facilities through innovative programmes of wage and self-employment.

V. Mahatma Gandhi Ideas on Sarvodaya: The Sarvodaya thinkers accept that democracy is the best form of polity so far conceived by human ingenuity, but they assert that the existing democracies have too many defects to be accepted as they are. Their criticism of democracy through based mainly on Indian experiences is generally applicable to all democratic governments (Patil, V.T.-1985). The fundamental defects of the present day democracy is that it ignores the organic nature of the society. It bases itself on the individual voter and the whole process rests on the arithmetic of votes leading to an atomization of the individual (Narayan Jayaprakash- 1959)

In the field of politics and administration independence with mean that the village manages its own administrative and legal problems without outside interference, through the panchayat. The grama panchayat is a body of the five persons to be chosen unanimously on the basis of merit without any party, caste or religions consideration and will be vested with all executive judicial and legislative powers. In case of any dispute the panchayat without as a court. All decisions effecting the economic, social and political life of the community will be taken by the panchayat. (Narayan Jayaprakash -1961).Explaining his stand on village Swaraj or Rama Rajya Gandhi said: "My idea of village Swaraj is that it is a complete republic independent of its neighbors for its own vital wants and yet interdependent for many other in which dependence is necessary. Thus every villages first concern will be to grow its own food crops and cotton for its cloth. It should have a reserve for its cattle, recreation and play ground for adults and children. The village will maintain a village theatre, school and public hall. It will has its own

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water works. Education will be compulsory up to final basic course. As far as possible every activity will be conducted on the cooperative banks. (Gandhi. M.K.).

VI. Conclusions: Panchayats have been in Indian villages from the time immemorial. Though many political changes have swept in India the social organization has nom remained stable more or less because of the stability provided by the Panchayats. The directive principles of state policy, in difference to the wishes of Gandhi, has laid down that the state shall take steps to organize village Panchayats and to endow them with such powers and authority as may be necessary to enable them to function as units of self- government. (Base, D.D-1980). In order to make the Panchayati Raj institution a really effective instrument of economic, political, and social growth the Ashok Mehta Committee has recommended strengthening of democracy at the grass-roots. This means that power should not be centralized at the Union and State levels as at present, but should go down to the district and mandal levels. (Muttalib-1980)

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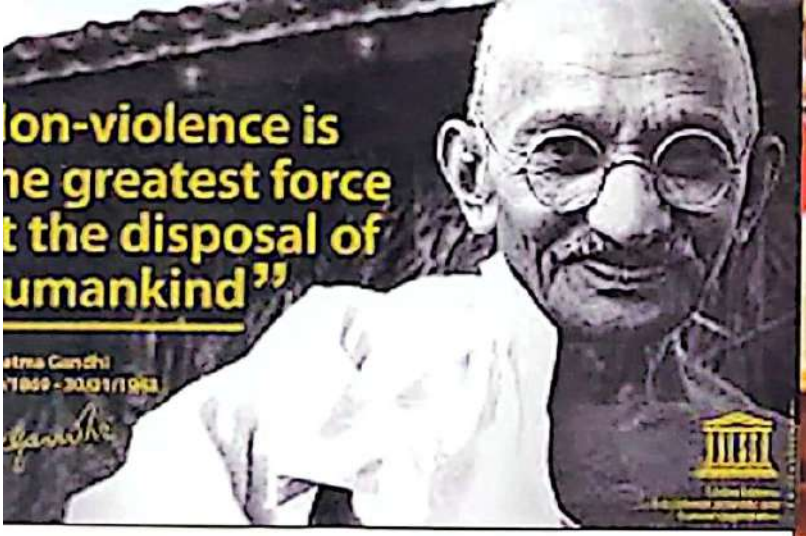

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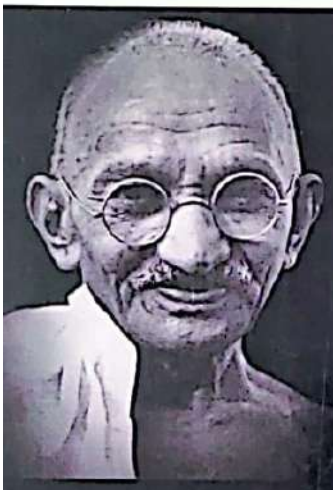
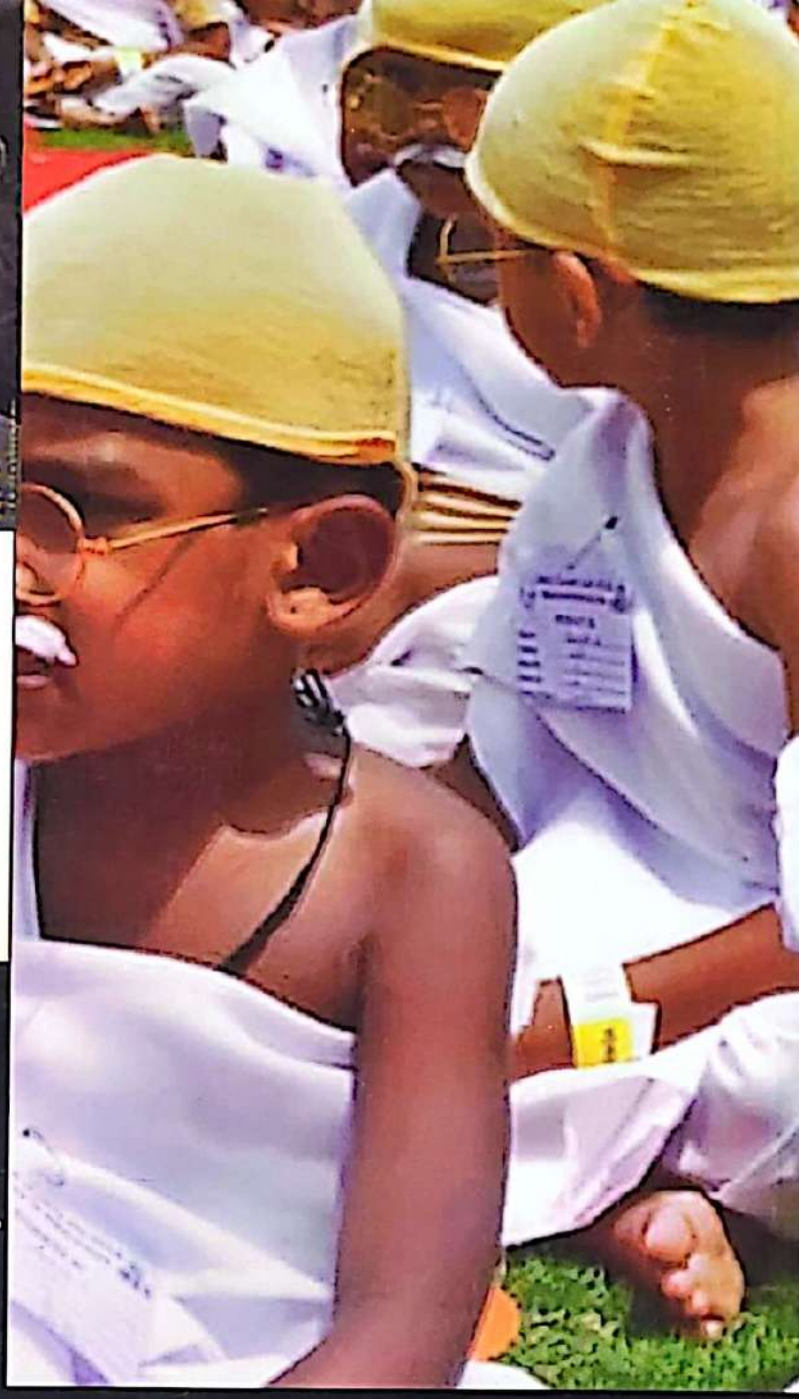


In a **gentle** way,
you can **shake** the world.

- Mahatma Gandhi



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"An Impact of Developmental Programmes for Social Transformation of Scheduled Castes & Scheduled Tribes"

Book No-2

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Caste and Social Discrimination in India: A Comment

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A popular belief about the cast system is that the present day inequalities are a result of past discrimination, primary confined to rural areas. In urban areas, focus are mostly in the formal sector that is viewed as essentially meritocratic, especially the private sector. Also, given to the difficulties of identifying caste in the relatively anonymous urban settings, the view is that bulk of caste discrimination occurs mainly in rural, traditional parts of the country. Within the social science literature more precise elaboration of the concept of discrimination has come from the economics in the context of race and gender. The mainstream economic literature throws more light on discrimination that works through markets, and non market truncations and depends the concept of market discrimination with some analytical clearing. It is also necessary to recognized that in "Group Exclusion" people are excluded because of their group identity and not because of individable attribute. Therefore we need to recognized diction between exclusion of an "Individual and Exclusion of Group". Individual often get excluded from various reasons specific to individual. In India, exclusion resolves around the social institution the excludes, discriminate, insolate, and deprive some groups on the grass of group's identities like caste, ethnicity, and religion, gender and others. The nature of exclusion associated with institution of the caste system particularly needs to be understood and conceptualized as it has been the gas's of quall opportunity policy of reservation for scheduled caste and tribe and for other background caste and the same is used as justification for growing demand to extend it to similar group like religious minority such as Muslim and low caste converted to Islam and Christianity also women. Hence, in this back ground the present study has been made to exam the caste based social exclusion and discrimination in India. In the process, equality of opportunity is denied. The discriminatory process can extend beyond access to information to processes of selection in which attributes with have little relevance for the performance of job, but tend to favour candidates with better social and economic endowment.

I. Social Exclusion and Discrimination: Concepts and Context

The phenomenon of social exclusion has existed in all societies and at different stages of their development. But its perception and forms have varied. In the European context of the later part of the nineteenth and most of the twentieth centuries, the concept was viewed primarily with the prism of welfare state (Saith-2001). While all citizens were treated equal and discrimination on the basis of colour, race and religion was not supposed to exist, yet certain categories of people were excluded from the provisions of the welfare state. These provisions had their origin in social security and welfare measures introduced in the case of factory workers (Bhalla and Lapeyere, 1999). Socially excluded were those not protected by these welfare provisions due to their not being eligible as they were not workers due to being mentally and physically handicapped, aged and invalid. Subsequently, of course, they were all covered by other provisions of the welfare state.

The concept of 'social exclusion', however, seems to continue to be associated with employment status, as the starting point in the European context, even in more recent periods. While initially ineligibility for social protection due to not being in the labour force and, therefore, in employment, was seen as social exclusion, in later years especially in the last quarter of the twentieth century, lack of work (unemployment) and vulnerable (low paid casual and informal employment without social protection which sharply increased in the wake of globalisation, was seen as a form of social exclusion (see e.g. a study of Paugam (1995) on France). Attempts have also been made to extend the concept further to relate it with poverty and social relationship, besides the labour market (e.g. Paugam (1996) in a multi country comparative study), and make it multi-dimensional incorporating lack of participation in what would be considered 'normal activities' – participation in consumption activity of at least a minimum level, productive activity by engaging in economically and socially valued work, political activity including voting and membership of political parties and social activity in terms of social interaction and membership of social-cultural organisation (see, e.g. a study by Burchardt *et al*, 1999) on Great Britain). An European Commission document, "Observatory on National Policies to Combat Social Exclusion, Report of 1992") defined social exclusion "in relation to social rights of citizens – to a certain basic standard of living and to participation in the major social and occupational opportunities of the society" (Gore, *et al*, 1995, p.2).

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Debate on social exclusion in the European context has led to the advancement of the concept in two directions: first, focus on factors, processes and dynamics that lead to poverty, and second, encompassing a multidimensional concept of living conditions, going beyond the notion of income shortage (Berghman, 1995). This is also a significant advance from the 'exclusion from the social protection', 'exclusion from welfare state' and 'exclusion in relation to employment' approaches developed earlier. Universal application of any of these – old and new – concepts of social exclusion is, however, fraught with serious difficulties, especially in the case of developing countries. The criterion of non-availability of social protection would place a large majority of workers

(86 per cent in the case of India, according to NCEUS (2006)) in the category of 'socially excluded'. The type of income support that the European countries with well-founded welfare state provide will require "an incomparably higher level of fiscal commitment in relation to resources" as it would have to be given to over half the population in these countries as compared to around ten per cent in industrialised countries (Osmani, 1991). And application of the criterion of lack of, or vulnerable and unprotected, employment would again qualify a large majority (over 80 per cent in the case of India) of workers to be "socially excluded".

Viewing social exclusion in terms of poverty is, no doubt, more meaningful, particularly if measured in a multi-dimensional mode. But here again the estimates of the socially excluded may turn out to be too large to be operationally meaningful. Use of income based poverty may yield more manageable estimates but that would be a rather limited approach to the concept. More important, poverty is an outcome, not a symptom of social exclusion. At the same time, social exclusion is, but not the only cause of poverty; nor is poverty the only outcome of social exclusion. It is not logically correct to identify one with the other.

II. Caste Based Social Exclusion and Discrimination

Social exclusion based on caste is by far the most common among its various forms practised in India. Discrimination against certain caste groups is generally a practice observed in Hindu society though in its broader interpretation which identifies dalits as the excluded groups it could be seen among other religious groups as well. Exclusion of ethnic groups commonly identified as scheduled tribes is of somewhat different nature as the basis of exclusion here is not one's position in caste-hierarchy, but cultural and geographical isolation.

Caste system has been a mechanism for social and economic governance of Hindu society since ages. It divides people in social groups with pre-determined and ascribed rights and responsibilities in public sphere. It envisages a broad division of labour in social and productive functions. A person belongs to a group by birth and heredity, not by any acquired attributes.

The most distinctive feature of the caste system is that it is hierarchical. It identifies castes as higher and lower, and superior and subordinate. Corresponding to them are superior and inferior occupations. Social exclusion of lower castes from occupations and activities seen as superior and respectable, and unfavourable (forced) inclusion in inferior and often "polluting" ones thus has been an integral part of the caste system and practised over centuries. Customary rules and norms were set to implement the system which were reinforced with religious and ritual sanctions (Scoville, 1991).

The severity and rigidity with which the caste hierarchy and division of labour is practised have, no doubt, got greatly reduced in modern times, particularly over the past 50-60 years, during which both legislative and policy actions have also been taken to eliminate certain most despicable forms of exclusion (e.g. untouchability) and to provide preferential treatment for capacity enhancement and socio-economic development of the identified disadvantaged castes. The scars of long period historical discrimination and exploitation are still visible in their endowment disadvantage; and, discrimination is still practised in several covert ways in different spheres of economic, social and political activities. In economic spheres, result of these processes is seen in terms of differential access to resources such as land, capital and credit, and to employment especially in better paying and more respectable occupations and positions. In rural India, for example, according to a study (Thorat, Aryama and Negi, 2005), only 16 per cent of the scheduled Caste households owned land, as against 41-percent of those

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from other castes; only 28 per cent of the former owned some kind of capital while the figure for the letter was 56 per cent. About two-thirds of the SCs subsisted on the basis of (casual) wage labour, while among other castes this category accounted for only one-third.

The end result of social exclusion and discrimination of all kinds is seen in terms of levels of living of the excluded groups. Even though the basis of exclusion is different in the case of Scheduled Tribes and Muslims, they also are found to suffer from similar disadvantage as the Scheduled Castes as indicated by the summary statistics indicating levels of living, namely, the incidence of poverty. Percentage of persons living below poverty line of household expenditure (Head Count Ratio-HCR) is much higher among them others. According to estimates for 2009-10, STs have the highest incidence of poverty at 32.2 per cent followed by SCs at 30.3 per cent, as compared to 17.7 per cent among other castes *(Table 1)* Muslims have higher incidence of poverty than Hindus though they seem better off than SCs and STs. It, may also be noted that poverty has declined most among Muslims, followed by other Hindu castes but least among STs, followed by SCs.

Table 1
Incidence of Poverty by Social Groups (%) (Expert Group Meth)

Group	*1993*	*1999-*	*2009*
Scheduled Castes	4	3	3
Scheduled Tribes	4	4	3
Others	3	2	1
All Hindus	3	2	2
Muslims	4	3	2
All	3	2	2

Source: Thorat and Dube (2012)

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Proceedings

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Message

I am extremely happy to know that the Department of Physics, Maris Stella College, Vijayawadais organizing a Three-day National Workshop on **"Physics and Technology: Modern Sensors Characteristics, Interfacing & Programming"from 7th to 9th November 2019**sponsoredbyAndhra Pradesh Pollution Control board (APPCB). I congratulate the organizers for choosing this relevant themethat seeks to provide sensor solutions through building application-ready devicesin the digital age. I am sure this workshop will be an enriching experience for the participants in the area of evolving environmentally friendly technologies.

May the deliberations and hands-on experience of the workshop provide insights for innovations and inventions. I extend my best wishes for the success of the workshop.

Sr. Sleeva Thumma
Correspondent
Maris Stella College

Message

Sensors have become an indispensable and integral part of digital ecosystems and have brought about a digital transformation. Billions of devices connected in a network enable objects to collect and transmit data using ever-evolving sensors. This new wave of innovation extends digital intelligence beyond dedicated devices such as PCs, tablets, and smart phones. I am extremely happy that the Department of Physics, Maris Stella College, Vijayawada has taken the initiative to organize a Three-day National Workshop on **"Physics and Technology: Modern Sensors Characteristics, Interfacing & Programming" from 7th to 9th November 2019** sponsored by the Andhra Pradesh Pollution Control Board (APPCB). The concept and theme chosen by the organizers has brought other disciplines like Computer Science, Electronics, Physics and Biology to the same platform to discuss innovations in the latest evolving technologies in the present educational scenario and pave way for interdisciplinary research. I hope the hands-on experience the workshop is expected to provide will generate a lot of interest and enthusiasm.

I extend my best wishes for the success of the workshop.

JQuadras fmm

Dr. Sr. Jasintha Quadras
Principal & Convenor
Maris Stella College
Vijayawada

EDITORIAL BOARD

About the Workshop

Extensive use of technology is one of the causes of today's environmental problems. Wireless sensors and Internet of Things (IoT) represent an opportunity to use technology for the better. They gather data and get a more complete perspective on the things we use to live and produce. Better oversight and insight allows us to improve efficiency and develop better solutions for sustainable development. Sensors remain at the heart of all the intelligent systems. Intelligent sensor-webs, based on the converging technologies of microsensors, computers, and wireless telecommunications support greatly critical activities such as the monitoring of remote environments, risk assessment and hazard mapping, and renewable resource information management. The knowledge gathered from integrated Earth sensing has the potential to empower managers and decision makers to act on critical climate, sustainable development, natural resource, and environmental issues.

In view of such significant role of sensors, the department of Physics had organized a Three Day National Workshop on 'Physics and Technology: Modern Sensors Characteristics, Interfacing & Programming' from 7th to 9th November 2019 sponsored by Andhra Pradesh Pollution Control Board, Vijayawada. The workshop aimed at arranging expert talks on Physics of various modern sensors, characteristics, and their role in interfacing, communication and interpretation of signals in the IoT world. It also focussed on their future research directions blended with effective hands on training sessions on emerging fields of environmentally friendly technologies with relevant equipment on multiple IoT applications. Dr Y S Rao, Dean R&D, S.P.I.T, Director Emtron Technologies, Mumbai, Dr. R. R. Sawant, Director Inventronics Pvt Ltd. Mumbai were the Master trainers of this workshop.

Mr. D. Anvesh, Executive Manager, R& D, Efftronics, Pvt., Ltd., Vijayawada gave the keynote address during inaugural session. His talk focused on 'Technologies for Digital Disruption' and briefed about Intelligent Agents, Augmented and Virtual Reality, IoT Solutions, AI and Cognitive Technology and Hybrid Wireless Technologies that will rule the world. He also spoke about the significant role of sensors in modern life and how they have created a big impact on our lives by turning streams of data into life-changing decisions. He ascertained that sensor-driven tech can foster socioeconomic development in emerging economies throughout the world.

The participants of this workshop belong to a heterogeneous group of faculty members and advance learners from diverse science programmes like Physics, Electronics and Computer Science. The master trainers of this workshop highlighted the latest information about the evolving technologies like Machine Learning, Artificial intelligence, Data Science and Sensor Technology. They explained about the working of various sensors and the dominant role played by sensors in interfacing all these new areas of knowledge. This workshop provided hands on experience in Modelling and Simulation in designing computational models of electrical and electronic circuits with components of required values using PSPICE. It also enabled the participants to interface the sensor based electronic experimental kits with computers to obtain the desired results. The sensor-based lab

experience enabled them to understand the physics concepts through the use of modern data acquisition tools. Integrating modern technology into the regular curriculum through such workshops equipped and updated the faculty and the students with tools that would benefit them in an increasingly technological society and improvedtheir intellectual abilities which are essential for their careers.

The three day workshop concluded on 9th November, 2019 and provided hands on experience, a lot insights, added extensive educational value, andrevived the spirit of participants for more learning. **25** faculty members and **45** advanced learners of UG and PG from ten different colleges. We received **28** articles on various workshop topics from participants which has been brought out as a proceedings of the workshop with **ISBN number 978-81-942990-6-6.**

The Department of Physics, Maris Stella College takes this opportunity to thank profusely the Chair Man and other leading authorities of Andhra Pradesh Pollution Control Board (APPCB) members for magnanimously sponsoring this event. We thank the resource persons of this workshop Dr Y S Rao, Dean R&D, S.P.I.T, Director Emtron Technologies, Mumbai, Dr. R. R. Sawant, Director Inventronics Pvt Ltd. Mumbai and Mr. D. Anvesh, Executive Manager, R& D, Efftronics, Pvt., Ltd., Vijayawada who contributed their best to make this programme more meaningful and successful. We extend our gratitude to Principals of respective colleges for encouraging their faculty and advance learners to participate in this workshop. We acknowledge our gratitude to all external faculty members and students who trusted us and this workshop and participated in it. We express our gratitude to Maris Stella Management and especially our Principal Dr. Sr. Jasintha Quadras for their constructive support. We thank the system administrators Mr. K. Prasad and Mr. K. Raju for their consistent support towards the effective conduction of the workshop by loading 60 computer systems with the required softwares and the programmes provided by the Master trainers. Our thanks are due to other supporting staff for all their contribution.

We thank our college press reporter Mrs. Swapna, Department of Economics, for all her services. Last but not least we thank the members of PRINT media for all their services in highlighting this event and giving good coverage in their esteemed news magazines and remain grateful for being part of our educational endeavours.

Thank You.
Yours Sincerely.
Dr. G. Little Flower and members of organizing team,
Department of Physics,
Maris Stella College, Vijayawada.

Contents

Proceedings of National Workshop on 'Physics and Technology: Modern Sensors Characteristics, Interfacing and Programming'
7th to 9th November 2019. ISBN No: 978-81-942990-6-6.

A Review on Node Detection in Wireless Sensor Network

K.Srikanth[1*], T.N.Prasada Rao[2], V.N.Malleswera Rao[3]
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Abstract

Wireless sensor network (WSN) is a special type of network node group which help in solving many real time requirements. The node participates in this group help in collecting information from various entitiesusing sensors and delivers it for the productive purpose. Wireless sensor network use hop to hop, end to end communication to deliver the right information efficiently. It helps in processing informationusing the secure, routing techniques. Intermediate node participation always makes it enable to provide high end delivery. A participation of node degrades the network performance due to lacking in peer to peer communication. Node involvement make more energy degradation from the given other participant nodes. In such scenario the detection and prevention the network from such node network is important. This paper discusses detection techniques of the node in wireless sensor network.

Keywords: WSN; Node; node network; routing techniques; network workload;

1. Introduction

Wireless Sensor Networks (WSNs) have become pervasive and are being used in a broad array of application domains, including agriculture, healthcare, surveillance and security. These WSNs are composed of small-scale nodes that have the ability to sense, compute and Communicate. Early sensor nodes were resource-constrained with limited capabilities, but recent advances in sensor hardware technology have made it possible to produce sensor nodes that have more processing power, memory and prolonged battery life.

Wireless Sensor Networks (WSNs) [1] using Architecture allocation and Detection technique and Mobile adhoc network are used in data packet transmission and network communication [2, 3]. The wireless sensor node network consists of various node data criteria which help in communication with the help of multiple sensor units. A data packet transmission over the range of node is done using the given network optimization techniques. WSN help in many private and public areas to provide communication, security to data transmission. While performing the data packet transmission, various protocols and mechanism to be followed which help in improving the delivery performance. Working with the energy model and avoiding the energy diffusion is also taken care using the WSN communication algorithms. Many sensor nodes participate and act as a node. They establish their replica and try finding the network information. Such information replication detection and prevention is also one of the important requirements in dealing with sensor network.

Wireless sensor network forms many advantage over the network such as finding the communication with weather forecasting, Communication with the user to provide better information while collecting same at real time. Military communication does use the sensor network application while they are working in remote area network. Temperature sensing and

dealing with collection of spatial data is also get performed using the wireless sensor network.

While dealing with such important network, there are intermediate entities which try to access usable information in different direction. Thus the selfish node concept is presented. The detection and prevention from such node is an important requirement of the time. This paper discusses about the node detection techniques which involve in detection and prevention over the wireless sensor network by various authours.

2. Various Techniques

The wireless sensor network deals with the node. The energy dissemination, information gathering and non- participation in communication hop module is being discussed here which is given solution to prevent by authors is presented.

Jebakumar et al. discussed the node detection by adopting replica allocation and analysis technique [4]. This paper also discuss on mitigation from node which hide their identity by generating its replica and further finding the node for alternative node selection. The node determine technique take use of given token generation to each node participants and then monitoring the token. The technique called token based umpiring approach TBUA is proposed. A network model over the node is presented where the token based approach is implemented with MANE protocol. The implementation of TBU approach is presented with AODV routing protocol. Finally a selfish quarantine is applied on selfish detected nodes.

Chanak P. et al. adopted fault diagnosis approach using the mobile sink based distribution over the wireless networking system [5]. Optimal tour diagnosis planning and fault detection over the hardware component is performed mutually. A network area polling over the system is performed, where mobile fault detection is applied and used. An infrastructure protection is observed with high efficiency and high end delivery in network is reported.

Priyanka Deokar took a survey over the different node such as hiding the properties from self-participation [6]. Working with the diagnosis over the wireless sensor network is discussed. An improvement for a dynamic routing and finding a node among them is suggested.

Sami UlGani et.al. presented the cluster based approach for the selfish node detection[7] and explained about the cluster generation, cluster finding technique and then optimizing the routing path to determine the working nodes. Further the dissemination of node is presented. All the clustering mining approaches which participate in the mining approach for selfish node detection has been discussed.

T.Gobinath et.al. suggested Leach protocol based routing over the wireless network [8]. A leader selection among the given node in a network is presented for finding of selfish node The given proposed solution works with the available given clustering models.

HOU Hui presented a fault tolerance method for detection of node and prevention from such node network [9]. Sensor nodes detects its own fault depends on the information from its neighboring nodes using Fault detection algorithm. The discussion enlightens how the node energy dissemination could be saved. The communication protocol with fault tolerance mechanism is presented to find node over the wireless sensor network. Dipali Bhosale suggested the fault tolerance and discussion mechanism using the cluster head from the network node availability [10]. The given FDRC approach is used for the cluster head node failure system. A monitoring node is presented which help in detecting the node among the available data packet sharing nodes.

Doaa Abdel Mohsen et.al. presented an approach which is a CNBD detection method for end to end transmission over the network [11]. A fault in network is determined initially followed with the sensor node level detection and further improvement is also suggested.

Authors	Algorithm/Technique	Remark/Further Extension
Imam Khan[1]	Architecture allocation and detection.	A network architecture Simulation
Ali Dora, Sewed Reza	Security challenges over the MANET.	Network security aspect
Kamel	Security Challenges In Mobile Ad Hoc Networks	Anew Study On Bolstering Tools, Balusters Validation And Evaluation Functions
K. Chitra	Cluster Heed Failure recovery Algorithm.	Secondary cluster selection.
Sami UlGani	Cluster based fault detection algorithm is proposed	Provides better network performance and detection accuracy.
T.Gobinath	fault tolerance method based on mobile agent federation	It also proposed communication protocol to initiate the fault repair system.

Conclusion

Wireless network help in improving communication in any of the wide area. The avoidance of physical system cost finding it useful in different circumstances that help in reliable communication. Many security algorithms, routing algorithm and optimizing the packet transmission is given. While using all node participation, there is some node which is node. They avoid their participation from the network to avoid their energy dissemination. Also sometimes, node acts in network to acquire the communication information which is exchange over the network. These papers discussed about the problem associate while node participate in the network. Different work which is performed to avoid node. A discussion table is also presented which help in understanding the overall scenario which is associate with node detection techniques.Thus node detection can get performed using the proposed solutions given by different authors.

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Women Entrepreneurship:

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CONTENTS

STATUS OF WOMEN ENTREPRENEURS IN ANDHRA PRADESH (A STUDY ON SRIKAKULAM DISTRICT)

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INTRODUCTION:

In a globalised economy where cost-effectiveness is the prime mover of any business, cheap labour along with flexibility of employment easily matches with women labor force. This has resulted in widespread feminisation of the labour force throughout the globe (Chen, et.al., 2005). Economic development is a very important component of women's social and economic development. Economic empowerment is one of the most effective means for organizing women who can be brought together only on the basis of felt needs. Economic empowerment refers to earning power, collective bargaining for economic gains, control over means of production, involvement in decision making regarding economic aspects and development of skills in management and it implies a process of redistribution of resources and power between different groups. It helps in building confidence, self assertion and courage. Rural Women's contribution to the economy is quite significant. Over 80 per cent of the working women in rural areas are engaged in agriculture and allied activities, they usually perform drudgery prone activity and not get equal wages with male workers. Given a chance women agriculture workers prefer to take up alternate economic activities. The government is also laying stress on empowering rural women by identifying alternate economic activities. In this backdrop, the present paper an attempt has been made to examine the economic viabilities of agriculture based enterprises for women in agriculture and the constraints and prospects of such entrepreneurial trades in Andhra Pradesh.

A BRIEF PROFILE ON WOMEN'S STATUS IN INDIA:

Indian's female population, as per 2011 Census, is 586.5 million and constitutes 48.5 per cent of the total population. The sex ratio is 940 women per 1000 men as per
2011 census. The declining sex ratio in India could be a reflection of the son preference in the Country. According to the Census of India 2011, female literacy rate is 65.46 per cent, while literacy rate is 82.14 per cent in case of male. The gender gap between male and female literacy rate should be narrowed urgently.

Even since India became free, there have been phenomenal changes in the conditions of women. The constitution has given women the much needed status. They are now equal before law. There can be no discrimination by the state on grounds of gender. In matters related to economic development, women continued to be marginalized both in policy formulation an programme implementation. In terms of employment, she enjoys the same status as men and has to be given equal pay for equal work. Women's work participation mostly goes unrecorded and unrecognised. They work roughly twice as many hours as men.

The report by the National Committee on the status of women reveals that women's participation in the economy has been declining since 1921. The reasons for the decline of women's participation in the workforce differ in urban and rural areas and in the rural areas there is a strongly rooted view that the wife's leisure might be regarded as a sign of status by others. The other factors that inhibits women's employment are heavy domestic work load, lack of assumed work, irregular and under payment of wages, absence of transport facilities, lack of child care centres and other supportive structures.

Now it is interest to analyse women work participation with some statistical evidences. The women's work goes unnoticed and is unpaid or underpaid. The double burden of work placed on her (un recognized household work and low pay in recognized work) coupled with social norms that prevent her form getting the requisite educational and technical skills result in a low female work participation rate, either real or statistical. Female work participation rate in India was 28 per cent (2004) as compared to other developing nations like Srilanka (30 per cent), Bangladesh (37 percent) and South Africa (38 per cent).

TABLE – 1 WORK PARTICIPATION RATES OF SEX (1972 – 2005)

(Percentages)

Year	Rural		Urban	
	Female	Male	Female	Male
1972 – 73	31.8	54.5	13.4	50.1
1987 – 88	32.3	53.9	15.2	50.6
1996 – 97	29.1	55.0	13.1	52.1
2000 – 01	28.7	54.4	14.0	53.1
2004 – 05	32.7	54.6	16.6	54.9

Source: Gender and MGNREGS – A Study of three poverty stricken states. Research

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Work participation rate for females in rural areas has increased from 28.7 per cent in 2000-01 to 32.7 per cent in 2004-05, where as in 2000-01 to 16.6 per

cent in 2004-05. The work participation rate remains lower for women than for men both in rural and urban areas. A sect oral breakdown of women workers reveals that 32.9 per cent are cultivators, 38.9 per cent agricultural labourers (as against 20.9 per cent men) and 6.5 workers in the household industry. Much of the increase in employment among women has been in the form of self-employment, 48 per cent of urban and 64 per cent of rural women workers describe themselves as self-employed.

STATUS OF WOMEN IN ANDHRA PRADESH:

The status of women in Andhra Pradesh in respect of the indicator like sex ratio, literacy rate; work participation rate are found to be better than the all India level in some aspects but compare to the four Southern States, Andhra Pradesh seems to lag behind. According to 2001 census the sex ratio in Andhra Pradesh is 978 which is far better than 933 at all India level, but regarding the Southern States, except Karnataka (965), Kerala (1058) and Tamilnadu (987) be recorded better sex ratio. Female literacy rate is lowest in Andhra Pradesh in relation to the Southern States and all India. Total female literacy rate in Andhra Pradesh is 50.43, In Karnataka it is 56.87, Kerala recorded 87.72, In Tamilnadu it is 64.43 and at the All India level it is 53.67. Work participation rate of females in the rural Areas is the highest in Andhra Pradesh at 43.2 followed by Tamilnadu at 41.3, Karnataka 39.9, All India 31.0 and Kerala 15.9 of the total female workers in rural Andhra Pradesh, the percentage of agricultural labourers is 60.7 per cent indicating that women are concentrated in low paid casual work. The share of agricultural labourers is 54.3 in Tamilnadu, 50.4 in Karnataka, 26.2 in Kerala and at the all India level it is 43.4. Low literacy levels and lack of other skills are leading to women crowding into the low paid casual labour category. The NSS data indicate that the percentage of rural female casual labor is 53.8 per cent which is the highest in the country and it is increasing overtime. Female participation rates in agricultural labour are high and female agricultural labourers exceed male agricultural labourers. Several schemes and programmes were undertaken in Andhra Pradesh as well as in other States, to develop skills among rural women for taking up entrepreneurial trades, in which various Government departments and NGO's were involved. There is a need to study the field level impact of the efforts of these departments and to identify viable trades for women to design and improve future programmes and policies for development of women.

OBJECTIVES OF THE STUDY:

1. To Examine the Economic viabilities of agriculture based enterprises for women in Andhra Pradesh.
2. To Study the impact of trade on the women in terms of income and their socio-economic conditions.

3. To understand the constraints faced and study the linkages and support system needed for enhancing the viability and feasibility of the trades.

DATA AND METHODOLOGY:

Both primary and secondary data have been collected for the present study. The secondary data have been collected from the annual reports of statistical subtracts of Andhra Pradesh, Publications of the World Bank (World Development Reports), Government of India, Human Development Report, Planning Commission Documents, NSSO Census reports are used. The multi – stage random sampling method is adopted in the selection of sample respondents in the study area. The primary data have been collected in selected villages of Srikakulam District of North Coastal Andhra Pradesh. In this district a voluntary organization viz., Youth Club of Bejjipuram (YCB) undertakes training in jute handicrafts to rural women. A number of programmes were implemented in collaboration with Government agencies. Two mandals Viz. Burja and Laveru and four villages i.e ABC pet from Burja Mandal and Adapaka, Budumuru and Bejjipuram from Laveru mandal are selected for this study. From the list of trained women obtained from the YCB a total of 40 women entrepreneurs in jute handicrafts were selected by simple random sampling and another 20 untrained women in the same activity were also selected. Thus the total study sample is 60 from district. Data were taken from these 40 women with the help of a pre-designed questionnaire. From the selected households only one women is considered as the entrepreneur. She may get help in the entrepreneurial work from other family members but they are not entrepreneurs. The study year was 2008-09, simple statistical tools like percentage and growth rates were used wherever it necessary.

BRIEF PROFILE OF THE SELECTED DISTRICT AND STUDY AREA:

Srikakulam district is the extreme North – Eastern Coastal district of Andhra Pradesh. The district is flanked on the North-East by the Eastern Ghats, on the north by the state of Orissa, down South and West by Vizianagaram district and on the East by the Bay of Bengal. The total area of the district is 5837 Sq. Kms. The district is divided into 38 mandals. Six of these towns. A part from, these sixth other mandals have100 per cent rural population. It has a coastline of 193 kms which is prone to Cyclones. A number of rivers flow through the district maninly Nagarvali, Vamsadhara and Suvarnamukhi. The district receives rainfall both during the South-West and North-East monsoons, the normal rainfall being 1162 mm per year.

As per 2011 census, the population of Srikakulam district is 26.38 lakhs, of which 13.60 lakhs are males and 12.78 lakhs are females. The sex ratio is 1014 which contrasts with state average of 978. The literacy rate is 58.08 per cent among males is 38.03 per cent among females. The total work participation rate

is 56.6 for males and 38.4 for females and in the rural areas it is 57.2 and 41.1 respectively. Of the total male workers in the rural areas 26.9 per cent are cultivators, 38.9 per cent are agricultural labourers, 3.3 per cent are household industry workers and 30.9 are other workers. The corresponding proportions for female workers are 19.5 per cent, 63.3 per cent, 4.9per cent and 12.3per cent respectively. Nearly 70 per cent of the total workers are in the agriculture sector though agricultural development is low in Srikakulam district. Agricultural is typically small farm agriculture, the average size of holding being only 0.73 ha as per the 2004-05 agricultural census. Though a variety of crops are grown, the yields are low.

The study area in Srikakulam district falls in three mandals and four villages. The three mandals are Amudalavalasa, Burja and Laveru. The villages are Budumuru from Amudalavalasa, ABC pet form Burja mandal and Adapaka and Bejjipuram from Laveru mandal. In the selected mandals the female literacy rate in Amadalavalasa mandal is better than the district average and female work participation rates are lower where as in the other two mandals viz., Burja and Laveru the literacy rate is lower than the district average and work participation rates are higher. Interestingly in these two mandals, the classification of female workers indicate that the percentage of cultivators are higher compared to Amadalavalasa mandal. Though, they are reported as cultivators only about two to five per cent of women own land in these mandals.

RESPONDENTS PROFILE:

The distribution of sample women by social class indicate that 55.84 per cent belong to OBC's (Other Backward Castes), 31.66 per cent belong to the 'general' category, scheduled castes form only 12.5 per cent and none belong to scheduled tribes. Majority of the women (40 per cent) are in the age group of 25-35 years, 31.17 per cent are between 35-55 years of age, 22.50 are in the age group of 15-25 years and 3.33 per cent are above 55 years. About 68 per cent women are married, 15 per cent are widowed, 5 per cent are divorced and12 per cent are unmarried. Literacy levels are very low among the sample women. About 73 per cent are either illiterate on have primary level of education, 25 per cent have secondary level of education and less than one per cent have graduation level of education.

About 50 per cent reported having subsidiary occupation but for cent per cent of the sample women the enterprise is their main occupation. Farm work is the main subsidiary occupation as reported by 40.83 per cent, the others are petty trade, 4.17 per cent and tailoring, 3.33 per cent. Among the women doing work 30 per cent are working in their own farms and 70 per cent are working for wages. The farm operations done by the sample women are mostly transplanting, weeding and harvesting. On an average they work for 6-7 hours per day and 100-120 days in a year. All the sample women doing farm work are using traditional

implements only. None of them are using the drudgery reducing implements that were developed in the recent times. Hundred per cent of the sample women are DWACRA members and they work in groups. Such group activity and their linkages with voluntary organization helps them in promoting their enterprise which may not be possible if they work individually due to their low levels of education.

JUTE HANDICRAFTS ENTERPRISE:

The sample women entrepreneurs of the jute handicrafts belong to Srikakulam district. Agriculture is the main source of livelihood for the people of this district, though it is, traditional and less developed. Though paddy is the main crop, jute occupies a place of importance in the cropping pattern of the district. Due to the scarcity of farm work activities as well as non-farm activities and due to availability of jute round the year. Many people started making jute handicrafts since the early 90s. Earlier Jute was used in making gunny bags and other packing material gradually, this craft was found to be a suitable means of income generation for women and some NGO's, as well as government agencies started training women in this craft. The Youth Club of Bejjipuram (YCB) in Srikakulam district is a non-profit voluntary organization, working for women empowerment. This club trains women in jute craft with the help of government agencies like DRDA, office of the development commissioner (Handicrafts) etc. For training the women it takes the help of experienced crafts persons and designers from reputed crafts organizations. The DWACRA programme also helped women as they could get bank loans and work in groups. Srikakulam jute handicrafts became popular over time and within the district Bejjipuram is an important centre for these handicrafts.

A total of 60 women entrepreneurs in jute handicrafts were selected for this study. Of these 60 women 62.50 per cent are trained women 60 per cent attended two training programmes each, 30 per cent attended one programme only and 10 per cent attended three training programmes. The women are taught making a number of items in jute like hanging chairs, bags of various shapes and sizes, table mats, door mats, wearing dhurries from jute, etc. Each training programme may concentrate on a specific items or two to three small items. Women are also trained in design work for weaving. The duration of the training programmes ranged from six days to six months also. Most of the programmes were conducted in the YCB premises which were sponsored by agencies like DRDA and NABARD. Some of the programmes especially training in design work were held in Bangalore at the Indus Tree crafts foundation.

TRAINING IS GIVEN IN SKILLS LIKE:

1. Jute Braiding - Braiding is the basic skills in the preparation of jute handicrafts. Jute first braided before tuning into any product.

2. Macreme – Macreme is a technique of knotting ropes into single and double knots. Items like hanging chairs hammocks, etc are made using this skill.
3. Weaving – Weaving dhurries on looms with cotton warp and jute weft is also taught at YCB.
4. Fabricating – Some artisans are trained in fabricating products by pasting jute fabric on cardboard. Products like per stands, photo frames, etc are made using this skill.
5. Tailoring – Tailoring is extensively used in the YCB products. Tailored bags of jute with cotton living are made by many women.

Among the trained women 28.00 per cent started making jute handicrafts more than four years back, 24.00 per cent completed three years, another 28.00 per cent completed two years an 20.00 per cent reported that it is the second year of starting the enterprise. The average age of the enterprise is 35.36 months for the trained and 31.86 months for the untrained women.

The main raw material used in the preparation of jute handicrafts is jute fibre. The other inputs used are colours, threads, bamboo sticks (used mostly while making furniture items) and wax. The supply of raw material is usually done by the Mutually Aided Co-operative Society in Bejjipuram and the YCB. The equipment used is very simple. They used scissors for cutting the jute, iron framed moulds for making bags of different shapes and sizes, a measuring tape and stitching needles. The process involves cleaning the jute, initially. The cleaned jute is first soaked in water, dyed with colour and again washed in soap water. The dyed jute is dried in shade. Next step is braiding the jute fibre as jute should be braided before making any product. Finally different products are made form the braided jute.

PRODUCTIVITY AND COST OF PRODUCTION IN JUTE HANDICRAFTS ENTERPRISE:

The sample jute entrepreneurs prepare bags, table mats, coasters, pen stands, magazine holders, hanging chairs etc., from jute using various methods mentioned earlier. Here the raw material, jute is measured in kgs and the output in numbers. During the study period, the trained women entrepreneurs used on an average 113.42 kgs of jute to prepare 111 items in a month. At this rate for 100 kgs of jute they can prepare 98 items where as the untrained women are able to make 96 items out of 100 kgs of jute.

TABLE-2
PRODUCTIVITY AND COST OF PRODUCTION OF JUTE HANDICRAFTS ENTREPRENEURS

	Productivity		Cost of Production Rs.					
	Raw Material used (kgs)	Out put produced (Nos)	Jute	Cane Sticks	Colours	Card board/lining cloth	Transport	Total Cost
Trained Avg. per Women Entrepreneur Per month	113.42	111	1501.92	60.00	81.25	43.33	82.92	1769.42
Avg. per 100kgs of jute used	100.00	98	1324.21	52.90	71.63	38.80	73.10	1560.05
Untrained Avg. per women entrepreneur Per month	68.47	66	989.73	40.00	57.80	22.93	47.67	1158.13
Avg. per 100 kgs of jute used	100.00	96	1445.49	58.41	84.41	33.48	69.42	1691.44

Source: Compiled from field data.

The sample women do not use any machinery while preparing the jute handicrafts except looms for weaving dhurries. The YCB has six looms and none of eth sample women have individual looms. The iron moulds for preparing bags are also owned by the YCB and used by all the women working there. As majority of women work in the crafts centre of YCB and the MACs they do not own any equipment individually, except they buy a pair of scissors in the beginning.

The total cost of production for the trained women for preparing 111 items amounted to Rs. 1769.42, the cost of jute is Rs. 1502.00, expenditure on transport is Rs. 83.00, colours is Rs. 81.25, the cost of cane sticks is Rs. 60.00 and for card board and lining cloth it is Rs. 43.33. According to these values the cost of production for 100 kgs of raw material is estimated Rs. 1560.05. like wise, for untrained women the cost of production per 100 kgs of raw material is Rs. 1691.44.

INCOME FROM THE JUTE HANDICRAFTS ENTERPRISE:

The prices of some of the items prepared by the sample women like hanging chairs, hammocks and dhurries range between Rs. 300-Rs.500 items like decorative mats, table mats, hanging pot holders, pen stands, office files etc, are priced at Rs. 50.00 or below. Shopping bags, lampshades and low-level furniture pieces range between Rs. 100-Rs 300 while making items like hanging chairs and hammocks two to three women work on a single piece and they share the profit.

The other items are made individually. The average price the sample women received for the items they prepared, during the period of enquiry, is Rs. 34.92. The total income is Rs. 3876.12 and the net income is Rs. 2106.70 (Table-3). By reported to earn 1572.56 per 100 kgs of raw material used. This is mostly because the average price received by them for their items is slightly lower than what the trained women get, as they concentrate more on making simple items.

TABLE-3

NET INCOME (PROFIT/LOSS) PER MONTH FROM THE JUTE HANDICRAFTS ENTERPRISE

	Quantity of out put (kgs)	Avg. Price per Unit Rs.	Total Income Rs.	Total Cost of Production Rs.	Net Income Rs.
Trained Avg. per Women entrepreneur per month	111	34.92	3876.12	1769.42	2106.70
Avg. per 100 kgs of Jute used	98	34.92	3422.16	1560.05	1862.11
Untrained Avg. per Women entrepreneur per month	66	34.00	2244.00	1158.13	1085.87
Avg. per 100 kgs of Jute used	96	34.00	3264.00	1691.44	1572.56

Source: Complied from field data.

IMPACT OF THE ENTERPRISE ON THE HOUSEHOLD AND ON THE STATUS OF WOMEN

Now it interest to analyse the impact of the enterprise on the socio-economic condition of the household, status of women entrepreneurs within the household and in the village community and the constraints in the selected enterprises.

A. CONTRIBUTION OF WOMEN'S ENTERPRISE TO HOUSEHOLD INCOME:

Women from the low – income household take up economic activities, which are usually unskilled and drudgery prone due to their low levels of literacy, only to augment the household income. Therefore, the impact of women's economic activities on the household is firstly measured by the increase in household income.

TABLE – 4

SHARE OF INCOME FROM WOMEN'S ENTERPRISE IN ANNUAL TOTAL HOUSEHOLD

INCOME-TOTAL SAMPLE

S. No.	Particulars	Jute Handicrafts	
		Rs.	Per cent
1	Farm Income	164551	9.69
2	Income from Annual Husbandry	110900	6.53
3	Wage Income	290200	17.09
4	Income from regular employment	173200	10.20
5	Petty Trade/Small Business	140000	8.24
6	Other Sources	4050	0.24
7	Total Household Income excluding Income Women's Enterprise	882901	51.99
8	Income from Women's Enterprise Annual	815196	48.01
9	Total Household Income including Income from Women's Enterprise.	1698097	100.00

Source: Field data.

Table-4 gives the details of household income including income from women's enterprise. It indicates that the contribution of the income from women's enterprise is considerably high. The contribution of the income from jute handicrafts enterprise is 48.01 per cent in the total household income. Before including the income from women's enterprise in the total household income, wage income was the highest with a share of enterprise income is the highest 33.30 per cent followed by the enterprise income at 30.34 per cent.

B. POVERTY LINE INCOME AND PER CAPITAL INCOME OF THE SAMPLE HOUSEHOLDS:

For analyzing the impact of the enterprise on the reduction of poverty, the household incomes excluding enterprise income and including enterprise income are compared with the poverty line income. For making such comparison the available data are household income for the year 2003-04 in the current prices, poverty level income for the year 1999-2000 in current prices, consumer price index for agricultural labourers (CPIAL) in Andhra Pradesh. For 1999-2000 with 1986-87 base and CPIAL of 2003-04 with 1986-87 base. Therefore for comparing the household income with poverty line income, poverty line income is to be converted into 2003-04 prices. It is done by using the following method.

CPIAL 2003-04 with base 1986-87

Poverty line income at 2004-05 prices = Poverty line income at 1999-2000 prices X .....

CPIAL1999-00 with base1986-87

TABLE- 5

PER CAPITA INCOME OF THE SAMPLE HOUSEHOLDS AND POVERTY LINE INCOME TOTAL SAMPLE

(Rs.Per Month)

Enterprise	Per capita income without including income from Women's Enterprise	Per capita income after including income from Women's Enterprise	Poverty line for Rural A.P
Jute Handicrafts	468. 58	901.32	294.25

Source: Field data.

It is seen that the above table reveals per capita incomes in the selected enterprise groups are well above to poverty line income even without the income from the enterprise, which indicates that the sample entrepreneur households do not belong to the very poor category.

C) PERCEPTIONS OF THE SAMPLE WOMEN ON THE CHANGES IN SOCIO-ECONOMIC

ASPECTS AND IMPACT ON THE STATUS OF WOMEN:

The sample women were asked about their perceptions on the impact of their entrepreneurial activity on the socio-economic conditions of the household. Majority of the women expressed that the enterprise has positive impact. Hundred per cent of the sample women expressed that there is an increase in the household income.

TABLE – 6

PERCEPTIONS ABOUT INCREASE OR DECREASE OF SOCIO-ECONOMIC ASPECTS

(Percentage)

Socio- Economic Aspects					Status within Household and outside			
S.No	Factors	Increase	Decrease	No. Change	Factors	Increase	Decrease	No. Change
1.	House hold Income	95.83	-	4.17	Self Esteem	87.5	-	12.5
2.	Assets/Comforts	91.67	-	8.33	Family Decision making	54.17	-	45.83
3.	Children's Education	75.00	-	25.00	Respect in the Village Community	83.00	-	16.67
4.	Drudgery of Household Work	8.33	62.5	29.17	Leadership Qualities	75.00	-	25.00
5.	Leisure	4.00	20.83	62.5				

Source: Field data.

Regarding assets/comforts 91.67 per cent of the jute handicrafts entrepreneurs reported an increase, with respect to children's education, as the household income increases there is a scope for providing better educational facilities for children. From the sample household, 75.00 per cent of the entrepreneurs reported an improvement in their children's education. Majority of the women felt that the drudgery in the household work reduced after starting the enterprise. This is due to reasons like increased support of family members in household work and due to rise in income they were able to purchase time saving and drudgery reducing kitchen equipment. Though the drudgery in household work declined, the sample women reported that they do not find any notable leisure (4per cent) due to their entrepreneurial responsibilities.

The preceding analysis indicate a positive impact of the women's entrepreneurial activity on the household income and the overall living conditions of the household, what is important is to examine whether the enterprise helped in empowering women. The perceptions of the women were recorded and analysed 87.5 per cent sample women are reported an increase in their self esteem while 12.5 per cent felt that there is no change. Majority of the women are reported that their role in the family decision making increased. They were able to take decisions regarding children's education, children's marriage, purchasing of assets in the household, etc.

The sample women also expressed that their status in the village community also improved. The village community treat them with respect and the women agricultural labourers every them and they DWACRA members and many of them were already members of DWACRA members, they develop leadership qualities which were further sharpened after starting the enterprise. The women entrepreneurs have to interact with several persons during the various stages of their entrepreneurial activities including during training programmes. The sample women entrepreneurs frequently attend DWACRA bazaars and exhibition and they are able to travel to different places with in the state and even to other states without their family members. Some women from the sample go as resource persons to other places. Many women expressed the view that if they have the financial support, they can start the enterprise on their own.

MAIN BENEFITS FOR WOMEN:

1. Almost all the sample women expressed that their self esteem increased after taking up the entrepreneurial activity and majority reported that their role in the family decision making increased.

2. Social respect: As the women's income increases and they become well trained and well educated, they gain social respect village are coming to centres, taking their advice and using their services.
3. They were able to take decisions regarding children's education, children's marriage, purchasing of assets in the household, etc.
4. Employment in their village.
5. Self respect: Working SHG/DWACRA members majority of them developed leadership qualities and they were able to interact with several persons related to their entrepreneurial activity.

MAIN PROBLEMS:

The following are the main problems are faced by women entrepreneurs:

1. The expected encouragement is not materializing at village level.
2. There should be demand for the products they make. In the absence of local demand at least there should be some agency to buy their product or facilitate the marketing.
3. About 52.0 per cent of the sample women are reported that is local demand for their product but 48.0 per cent answered is the negative. Though there is local demand, the women selling in the market on retail forms only 12 per cent in the total. Forty four per cent expressed that they have difficulty in marketing the product.
4. About 32 per cent reported difficulty in procuring the raw material.
5. When asked whether women face problems in entrepreneurial activities 48 per cent reported in the positive and 52 per cent in the negative. Those who felt that there are problems complained of marketing problems, procuring raw material.

CONCLUSION:

The contribution of rural women to the economy is quite significant. Over 80 per cent of the working women in rural areas are engaged in agriculture and allied activities. The usually perform drudgery prone activities and do not get equal wages with male workers. Given a chance women agricultural workers prefer to take up alternate economic activities. The Government is also laying stress on empowering rural women by identifying activities. The Government is also laying stress on empowering rural women by identifying alternate economic activities. The present study reveals, the enterprises taken up by the women are found to contribute significantly to the household income. Despite the fact that there is improvement in their socio-economic position, these women do face problems especially in marketing their products. As the sample women are all DWACRA members they do not face problem for their working capital. If they can get bank loans, some women prefer to start the enterprise on their own on a

larger scale. Hence, it may be concluded that women entrepreneurs need help in improving their forward and backward linkages.

Poverty, illiteracy, ignorance, unfavorable atmosphere, lack of innovation and bureaucratic attitude of the officials are some of the constraints in the development of women entrepreneurs. Therefore, an integrated approach and concerted efforts are needed for the development of entrepreneurs' skills. Human Resource Development is a key element in this endeavor also.

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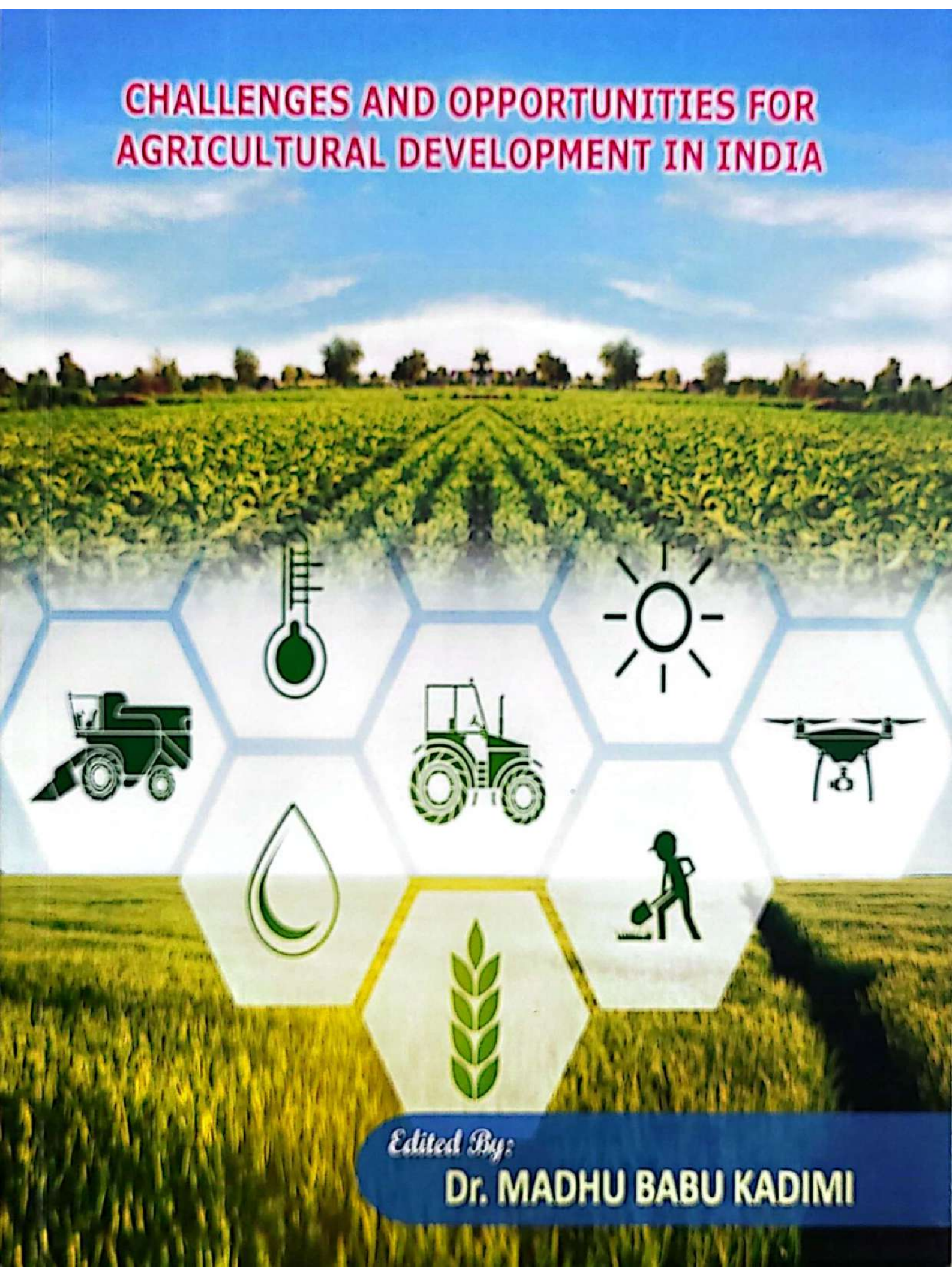
CHALLENGES AND OPPORTUNITIES FOR AGRICULTURAL DEVELOPMENT IN INDIA



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CHALLENGES AND OPPORTUNITIES FOR AGRICULTURAL DEVELOPMENT IN INDIA

Edited by

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Self Help Groups And Women Empowerment:: A Comment

Dr.D. Rajyalakshmi

Introduction:

Empowerment can be described as an improvement in a person's social, psychological and economic degree of freedom (e.g. Solava & Sabina, 2007). Empowerment is used as a tool to make important life choices for individuals or groups and to transform these choices functionally. A female should not only be regarded as beneficiaries, but should also be viewed as a strong contributor to any society or community's growth. This could be achieved through society participation and affirmation of their rights associated with their socio-economic well-being mentioned women empowerment as a process of acquiring an ability, which is helpful for women to make according life choices and further allow them to play their own roles. Indian Government also declared 2001 as the year of 'Women's Empowerment'. Empowerment is considered as a multi-dimensional, multi-faceted and multi-layered model.

India's Constitution provides women with equal opportunities in various areas of life. Nevertheless, a large number of women are either ill-equipped or unable to drive themselves from their historically unsatisfactory socio-economic conditions. Microfinance programmes like the Self Help Group Programme in India have increasingly been promoted for their positive economic impact on poor people and for the belief that they empower women which have also been found true in many empirical studies. Women's empowerment is viewed as a process in which women challenge the existing norms and culture to effectively improve their well-being . Since microfinance programs like SHGs programme are based on the principle of equity, justice and are also participatory in nature, they have significant potential for contributing to women's economic, social and political empowerment. Access to savings and credit can initiate or strengthen a series of inter linked and mutually reinforcing 'virtuous spirals' of empowerment. The SHGs programme has, therefore, emerged as major strategy to combat the twin issues of poverty and unemployment that continue to pose a major threat to the polity and economy of both the developed and developing countries.

Microfinance means providing the poor in rural and urban areas, especially women, with savings and credit facilities for setting up or expanding businesses, investing in self-employment and growing household security. These programs are becoming more and more common in India. They are believed to lead to the reduction of poverty and empowerment of women. However, several studies on micro-finance have also questioned this optimism. There is a great controversy whether participation in microfinance promotes women empowerment or not. Many microfinance initiatives target women to empower them directly. Their underlying assumptions, however, are distinct. Many claim that the poorest and most vulnerable of the oppressed are womenMany argue that engaging in women's ability empowers them to make choices that are beneficial for themselves, as well as leading to increased economic growth and development. Another incentive isthe literature evidence showing

that an increase in women's resources contributes to the family's higher well-being, especially children.

Eventually, a growing number of microfinance institutions favor representatives of women because they believe they are better and more reliable lenders, thereby adding to their financial viability. A more feminist point of view stresses that access to financial capital is an opportunity for women to gain greater empowerment. While many accept that empowerment of women is an important development goal for microfinance projects, what empowerment of women entails is still unclear.

Microfinance in Andhra Pradesh

The Indian microfinance chapter began from the Andhra Pradesh (AP) agrarian state. Many of India's first MFIs (Microfinance Institutions) have been launched in Andhra Pradesh and 5 of India's largest NBFC (Non Banking Financial Company) MFIs are headquartered in AP making it the epicenter of India's microfinance industry. The region was the first to attract interest from mainstream investors.

The designation of microfinance as a priority lending sector made it advantageous for banks to lend to MFIs, and by 2006, AP organizations had substantial capital inflows. Public and private banks made large loans to MFIs with relatively little scrutiny, making it possible for MFIs to grow rapidly without sufficient stability in the form of institutional capacity building or a solid capital.

However, the lack of oversight of the activities of the MFI eventually led to oppressive lending practices, in the quest to meet their demands, they lend money to already indebted borrowers, with data collected from the microfinance center of the IFMR (Institute for Financial Management and Research) showing that more than 83% of households had loans from more than one source. However, MFIs took no care of the borrower's end-use of cash and used coercive collection tactics, culminating in 2010 with the sensational media accounts of farmers in AP being driven to suicide because of their inability to repay their loans. Our credit policies focus primarily on unmet and essential rural needs, such as water, sanitation, electricity, education, etc., through a subsidized capital with an interest rate of 12-14%. (milaap.org).

Working of SHGS in Andhra Pradesh

Now, the attention is paid to enumerate data relevant for a comprehensive understanding of the study area, district and mandal-wise. More specifically data pertaining to the existing microfinance schemes in the selected districts of Andhra Pradesh, formation of Self-Help groups, bank linkages, economic activities, other facilities, etc. have been discussed.

Microfinance Institutions

A number of public-sector and private-sector institutions are offering microfinance services in India. They can be generally divided into two categories: formal and informal.

The formal category includes financial institutions for Apex Growth, commercial banks, local ural banks and cooperative banks that provide microfinance services in addition to their general anking operations and are referred to as microfinance service providers.

On the other hand, Micro Finance Institutions (MFIs) are generally referred to as informal nstitutions that undertake microfinance services as their main activities. In the case of formal inancial institutions that offer micro-finance services, private and public ownership is found.

Microfinance Service Providers

Microfinance service providers include top institutions such as the National Bank for griculture and Rural Development (NABARD), India's Small Industries Development Bank (SIDBI) nd Rashtriya Mahila Kosh (RMK). Business banks, national rural banks, and cooperative banks rovide microfinance services at the retail level.

There are nearly 60,000 formal banking retail credit outlets in rural areas, consisting of 2,000 district-level cooperative bank branches, over 14,000 Regional Rural Banks (RRBs) branches nd 30,000 rural and semi-urban commercial bank branches, in addition to 90,000 village-level credi ooperatives.

On average, for every 5,000 rural people, there is at least one retail credit outlet. This physica nfrastructure development of banking facilities entering the country's far-flung areas to provide th ural population with deposits, credit and other banking services is an unprecedented achievement o he Indian banking system.

ociety for Elimination of Rural Poverty (SERP)

The Society for the Elimination of Rural Poverty (SERP) was established by the Andhr radesh Government (GOAP) as a responsive support structure to promote poverty reduction throug ocial mobilization and development of rural poor living in AP. In compliance with the 2014 A ecognition Act, SERP is divided into AP SERP and TG SERP to introduce Indira Kranthi Patha IKP) in all 656 rural mandals of 13 rural districts in AP to emerge from poverty and remain out overty. SERP operates on a holistic multi-dimensional approach to alleviate poverty by focusi airly on the value chain for Livelyhood and metrics of human development. SERP's co levelopment unit is rural poor households, and all SERP programs seek to achieve basically tw utcomes: sustainable household income per capita of Rs.1,00,000/- per year from multiple sourc nd improved human development indicators

With this in mind, by organizing 69, 31,113 rural women into 6,52,440 SHGs, 26,753 villa rganizations, 656 Mandal Samakhyas, and 13 Zilla Samakhyas, SERP has worked tirelessly o pecific community-based organization system. For the community-based organization in the wo SERP has developed a specific institutional structure. This CBOs system in A.P has facilita ggregate bank loans of Rs. 43,596.60 lakhs of commercial bank loans to SHG members, t

Mrketing of Rs. 558317 crores resulting in farmers benefiting from Rs 15/- to Rs 100/- per quintal, pesticide free cultivation of Rs. 2000/- to Rs. 15000/- per acre in 2013-14 alone resulting in farmers saving, etcThis particular model was introduced at the national level in India by Ajeevika (National Rural Living Mission) (serp.ap.gov.in)

Other key results of Residual SERP of Andhra Pradesh.

- 2,64,043 Disabled persons (DDPs) in 27,708 unique PWD SHGs
- 2,761 acres of fertile land acquired and handed over to rural poor with guaranteed sources of water.
- 32,42,185 lakh women enrolled in Abhayahastham and another lakh rural poor household enrolled in JBY through the country's largest welfare programs.
- Established 2,464 Nutrition and Day Care Centers.
- 2,275 Centers for early childhood education opened up to 2171 students.
- 35,122 women's lawsuits resolved.

Vision and Mission

The disadvantaged communities shall be empowered to overcome all social, economic, cultural nd psychological barriers through self-managed organizations. They will attain higher productivity ith improved skills and asset base and utilize resources to full potential and gainful access to ervices.Our missions is to enable the disadvantaged communities perceive possibilities for change nd bring about desired change by exercising informed choices through collective action.

HG Integration – Andhra Pradesh

Self-Help Groups (SHGs) are becoming the important platform for integrating people. SERP entified the existing SHGs potential for integrating people. Self-help groups are geared for mutual pport, information, and growth.

Self-help is based on the premise that people who come together with a common disability ll help each other and themselves to overcome the social challenges they face. SHGs incorporate low-income groups with the rest of the rural community by ensuring that they engage more iciently in a more equal share of development benefits. Such communities not only stimulate nomic growth, but also provide employment and boost the self-reliance quality of rural life. SHGs, e a unique approach for members to gain financial protection.

sion for Elimination of Poverty in Municipal Areas (MEPMA)

The Mission to Eliminate Poverty in Municipal Areas (MEPMA) is an AP Society agency is part of the Municipal Administration & Urban Development Department.

apowering poor urban women, especially those living in slums, is MEPMA's main goal:

Training urban women in self-help groups (SHGs) and encouraging financial savings and institutional loans:

- 10-12 urban women form Self Help Groups (SHGs) under the aegis of MEPMA. One Slum Level Federation (SLF) is made up of about 20 SHGs. There are 25-35 SLFs in a Town Level Federation (TLF).
- MEPMA supports internal savings and the following are internal loans between members 1.4 lakh women forming into 1.83 lakhs Self Help Groups
- Savings / Corpus of 1.83 lakh Self Help Groups (SHGs - Rs. 496.00 Cr
- Savings / Corpus of 6093 Slum Level Federations (SLFs) - Rs. 91.00 Cr
- Savings / Corpus of 129 Town Level Federations (TLFs) - Rs.4.43Crs

Disability Intervention:

- As part of the mainstreaming of people with walking disabilities in dictation services, the total number of PWD SHGs is 4,952 with 0.86 PWD participants in Lakes.
- Total No. of Vikalanga Samakhyas Town (TVS) is formed-82 and 111 PWD volunteers are identified and trained to socially mobilize PWD support through TLF.
- Cooperation of Bhagavan Mahaveer Vilalangula Seva Samakhya MEPMA facilitated the conduct of 11 camps for different persons in 10 district approvals.

apacity Building of Community Based Organizations

- To this end, daily training is organized through the Administrative Staff College of India (ASCI), the Center for Good Governance (CGG), Dr. Mam Chennareddy of the Human Resource Development Institute (MCR HRD), the Regional Center for Urban and Environmental Studies (RCUES), etc. For capacity building of SHGs, the CRP approach is being pursued.
- Member's training has been taken up in 1,50,000 SHGs
- Book-keeping training has been imparted to 1, 40,000 SHGs.

reating access to credit by providing Bank Linkage:

To date, it has provided more than Rs.7700.00 Crores of bank loans to 1.51 lakhs SHGs, cluding repeated dosages. The concept is to provide soft loans to meet daily needs such as chooling, nutrition, and other social needs, and to carry on income-generating projects to boost their conomic condition. The key slogan is to defend urban women against the clutches of money lenders,

micro-finance institutions, etc. which charge exorbitant interest rates. Previous interventions by the Govt of A.P through the Pavala Vaddi scheme (Interest at 3 percent per annum) resulted in interest portion being reimbursed to the amount of Rs.333.85 Crores. The VLR scheme was introduced from 1-1-2012 and will reimburse the qualifying SHGs for the taotal intrest under the scheme. As of the date qualifying VLR is Rs. 121.62 Cr to disburse SHGs and Rs.11.50 Cr to SHG accounts.

Loans with Subsidies for self employment units:

In order to set up Micro Business Enterprise, Undesr Urban Self Employment Program (USEP) MEPMA will arrange 25% of the total loan grant. Under USEP, 37,935 units have been set up to date. Under UWSP, MEPMA offers subsidy for the establishment of group companies to the sum of 35 percent of the total amount of the loan. Under UWSP, 278 units have been set up so far.

c) Stree Nidhi (State Level Women Credit Cooperative Society)

The Government is Stree Nidhi of A.P. As a society, the credit institution was formed. It is SHG Women's credit cooperative society, SHG Women and SHG Women. Of the 10 directors on Stree Nidhi's board, three are from the Urban SHGs. The goal is to provide "Credit Gap Funding" from "Ban on Micro Finance Institutions." A mobile phone and a CUG Sim Card are issued to each Slum Federation.

Conclusion

It is concluded that the microfinance has a significant role in bridging the gap between the formal institution and the rural poor. There is need to increase householder loan to microfinance by banks and financial institutions. If the government were to enact the policy that would regulate the quality of SHGs and tied this to their eligibility for SHG Bank Linkage, then this would help bring about a more measured and responsible growth to the movement.

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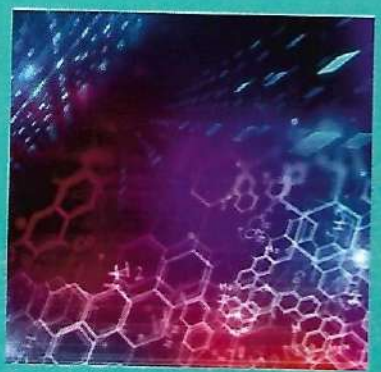

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To Determine the Frequencies and Wavelengths of *C. Diurnum* Leaves by using Molecular Spectroscopic Analysis

Dr. Giri Prasad Gorumutchu, Dr. Chandra Mohan Kurmarayuni, Dr. Sreeram V., Dr. K. Swarnalatha and Dr. S. Aravind

Abstract

The present new study was carried out to determine the frequency and wavelengths in *C. diurnum* (*C. diurnum*) leaves by using molecular spectroscopic instruments (FT-IR spectroscopy and UV-Vis Spectrophotometry). A series of extracts were prepared by using solvents (polar and non-polar solvents) and *C. diurnum* dried leaves powder. The polar (ethanol, double-distilled water, and ethyl acetate) and the non-polar solvent extracts (hexane, and carbon tetrachloride) put into the FT-IR spectroscopy, give the frequencies at 3330.61 cm^{-1}, 1716.17 cm^{-1}, and 3340.87 cm^{-1} for polar and frequencies at 1702.86 cm^{-1} and 1716.17 cm^{-1} for non-polar extracts. The polar and the non-polar solvent extracts put into the UV-Vis Spectrophotometry give the wavelengths at 538 nm, 608 nm, 647 nm, 677 nm showed for ethanol, 542 nm, 612 nm, and 672 nm showed for double-distilled water, 555 nm, 648 nm, and 680 nm for ethyl acetate for polar solvent extracts. Further, the wavelengths showed at 613 nm, 647 nm, and 682 nm for hexane and 564 nm, 597 nm, and 646 nm for carbon tetrachloride for non-polar solvent extracts. The polar solvent extracts showed -OH stretching frequency for ethanol extract, -OH stretching frequency for double-distilled water extract, and -C=O stretching frequencies (acid) for ethyl acetate extracts, and also the non-polar solvent extracts give the -C=O stretching frequencies (acid) for hexane extract and -C=O stretching frequency (ester) for carbon tetrachloride extract.

Keywords: *C. diurnum* dried leaves; polar and non-polar solvents; FT-IR; UV-Visible spectrophotometry.

Introduction

C. diurnum (*C. diurnum*) (Figure 1) is a tree, identified in the West Indies country, and the name of the family is Solanaceae. *C. diurnum* has

been announced as an ornamental shrub in the majority of subtropical and tropical America. It is also recorded as potentially invasive or invasive in Hawaii, Florida, Marianas Islands, Tonga, The Democratic Republic, Guam, South Africa, Mexico, and Bahamas [1-4]. The leaves are pale green below and dark green above. The length of the leaves is 5 inches, and the width is 1.5 inches. These leaves are relatively quick growth and have a shorter lifetime from 5 to 20 years [5]. Regular names of *C. diurnum* are followed day-blooming jessamine, day-blooming jasmine, day-blooming Cestrum, *and* king of the day (Din ka Raja). *C. diurnum* is easily generated from the plants, which generate the highest abundance [6]. The leaves are glabrous, simple, entire, ex-stipulate, alternate, obtusely wedge-shaped below, and ovate-lanceolate in structure with an obtuse apex.

The species has run away from naturalization and cultivation in more regions where it produces as separate plants or in woods. *C. diurnum* is incorporated in the international compendium of weeds as an ecological weed [7]. It is widely used in gardens in India. The leaves of *C. diurnum* are informed as sources of D3 vitamin and aerial pieces are additionally described to have thrombolytic and cytotoxic activities [8, 9]. *C. diurnum* flowers are commonly used as ornamental for their beautiful appearance, ease of establishing, normal size, and fragment flowers, it is intolerance of extreme shade and firstly disappears when comminated by forest. The plant develops seeds that can be simply spread by birds [5].

C. diurnum species is extremely flexible and can develop on lands of all surfaces, from all parental materials. In regions getting about 1400-2400 nm of precipitation it assertively colonizes biological areas [3, 5, 10]. *C. diurnum* fruits and flowers are year-round [5] and flowers are daylights visited by insects, particularly butterflies [11]. *C. diurnum* spreads in the region getting precipitation ranges varying from 800 to 300 mm, but highly aggressively colonizes rainfall regions that received from 1400 to 2400. It accepts soils of all surfaces, from all parental materials but is most popular in limestone regions.

Greater plants and great infestations should be removed, and the removed species can be reacted with herbicide. Successful herbicide is triclopyr plus imazapyr, 2,4-D plus picloram, or picloram. Triclopyr plus imazapyr is used in the treatment of basal stem [12].

Fig 1: *Cestrum diurnum* plant leaves

Literature review

Phytochemical evaluation and anatomical examination of two groups of *C. diurnum* [13, 14]. Explains the antimicrobial activity of *C. diurnum* in essential oils. GC-MS analysis of *Cestrum Nocturnum* in methanolic extract [15]. Antimicrobial activities and Mosquito larvicidal of manufactured silver nanoparticles (Ag NPs) using fruit extract of *C. diurnum* [16]. Antioxidant activity and chemical arrangement of organic extract and essential oils of *cestrum nocturnum* leaves [17]. To isolate the norlignan glycoside by using *C. diurnum* leaves [18]. Isolation of two compounds like ursolic acid and Tigogenin using ether and ethanolic extracts of *C. diurnum* Linn [19]. *C. diurnum* leaves an herbal natural substance by biological fingerprint utilizing the LC-ESI-QTOF-MS/MS [20]. Using *C. diurnum* plant extracts for analyzing the antibacterial actions [21, 22] and their biocontrol efficiency of *C. diurnum* leaves versus the larval ways of Anopheles Stephens.

The present new study was carried out to determine the frequency and wavelengths in *C. diurnum* (*C. diurnum*) leaves by using molecular spectroscopic instruments (FT-IR spectroscopy and UV-Vis spectrophotometry).

Materials and methods

Materials

All high-grade HPLC solvents like hexane (C_6H_{14}), ethanol (C_2H_5OH), ethyl acetate ($CH_3COOOC_2H_5$), and carbon tetrachloride (CCl_4) and for experimentation were purchased from Merck Company Mumbai.

Collection of *C. diurnum* leaves

Fresh *C. diurnum* leaves were collected from A.G & S.G.S College, Vuyyuru Mandalam, Krishna District, Andhra Pradesh, India. These collected leaves wash with distilled water and dried for three weeks under shaded (Figure 2a). After three weeks *C. diurnum* leaves are grinded with the help of a mechanical grinder up to powder form (Figure 2b). This prepared powder was put in black plastic bags and kept in sealed bottles for further investigation.

(a) (b)

Fig 2: *C. diurnum* Shaded dried leaves (a), Powder (b)

Preparation *C. diurnum* leaves extract with various solvent

A series of extracts were prepared by using solvents (polar solvents; ethanol (S-2; 50 mL), double-distilled water (S-3; 100 mL), ethyl acetate (S-5; 100 mL) and non-polar solvents; hexane (S-1; 50 mL), carbon tetrachloride (S-4; 50 mL)) and *C. diurnum* dried leaves powder. Mix 2 grams of shaded dried *C. diurnum* leaves powder and 50 mL of solvent in RB flask and reflux through Soxhlet extraction method for 3 h. Filtered with Whatman filter paper and the filtrate was kept in sealed bottles at 5 °C until usage (Figure 3).

Fig 3: *C. diurnum* leaves extract with solvents like Hexane extract (1), Ethanolic extract (2), Double-distilled water extract (3), Carbon tetrachloride (4), Ethyl acetate extract (5)

Characterization techniques

The prepared extracts were analysed by using molecular spectroscopic analysis such as Fourier Transform-Infra Red spectroscopy and Ultraviolet-visible spectrophotometry.

FT-IR spectroscopy: FTIR5300, JASCO model number, FTIR Instrument with the wavelength of 500-400 nm scanning range were used for taken spectra.

UV-Vis spectrophotometer: UV-300 model number, UV-Vis spectrophotometer bandwidth is 2.00 nm and 190.00 to 900.00 mm scanning range were used for taken spectra.

Results and discussion

To analyse the functional groups in *C. diurnum* leaves extract with five types of samples (dried leaves powder with various solvents like hexane extract, ethanol extract, double-distilled water extract, carbon tetrachloride extract, and ethyl acetate extract) using FT-IR spectroscopy [23]. The different frequency ranges observed from obtained absorption spectra were tabulated in Table 1.

Table 1: FT-IR spectra frequencies range in five types of samples

S.NO	Frequencies Ranges	Functional Groups
1	3400-3200 cm^{-1}	Hydroxy group
2	2843.71-2928.10 cm^{-1}	CH Starching frequencies
3	1621.59-1730.83 cm^{-1}	C=O Starching frequencies
4	1462.65-1378.18 cm^{-1}	CH bending frequencies
5	1180.32-1238.88 cm^{-1}	C-O Starching frequencies
6	871.56-776.98 cm^{-1}	Mono or di-substituted benzene

The first sample (*C. diurnum* leaves to powder and hexane extract) is placed into the FT-IR instrument to give IR (infrared radiation) spectra (Figure 4). The different frequencies are observed at 3382.09 cm^{-1}, 2921.30 cm^{-1}, 2849.54 cm^{-1}, 1702.86 cm^{-1}, 1462.65 cm^{-1}, 1365.82 cm^{-1}, 1180.32 cm^{-1}.

In the spectra, C=O stretching frequencies are detected at 1702.86 cm^{-1}, which frequency given the functional group is saturated acid [24]. Generally, carboxylic acid C=O starching frequencies decrease from 1730 to 1700 cm^{-1} for saturated acid, and carboxylic acid C=O starching frequencies decrease from 1710 to 1680 cm^{-1} for aromatic compounds because it is containing conjugation. The C=O stretching frequency in saturated acid is more than in

aromatic compound it is containing conjugation. The peak is very sensitive to either the peak present in a saturated acid compound or aromatic acid compounds.

The broad absorption peak was observed at 3382.09 cm^{-1}, this peak represents the -OH stretching frequency. Generally, carboxylic acids contain a broad absorption peak due to hydrogen bonding. The -OH stretch frequency and -OH bending (in-plane and out-plane) frequency ranges are observed from 3500 to 2500 cm^{-1} and 1440-1395 cm^{-1} and 950-910 cm^{-1}. A few carboxylic acids contain combination bands and overtone bands, hence the -OH stretch frequency falls from 2800 to 2500 cm^{-1}. The intensity of the peak in FT-IR spectroscopy is dependent on the change in the dipole moment (μ) and $d\mu/dx$ in the sense of bond length through a vibration. The carboxylic acid is highly polar in nature, hence fundamental bands, combination bands, and overtone bands are large. But this broad absorption peak was observed at 3382.09 cm^{-1}, hence small combination bands and overtone bands.

The C-H asymmetric and symmetric Stretching vibration frequencies are detected at 2921.30 cm^{-1}, and 2849.54 cm^{-1}. The C-H bending vibration frequencies (in-plane) are detected at 1462.65 cm^{-1}, and 1365.82 cm^{-1}. This frequency signifies the alkyl group present. The strong C-O stretching vibration frequencies are detected at 1180.32 cm^{-1}.

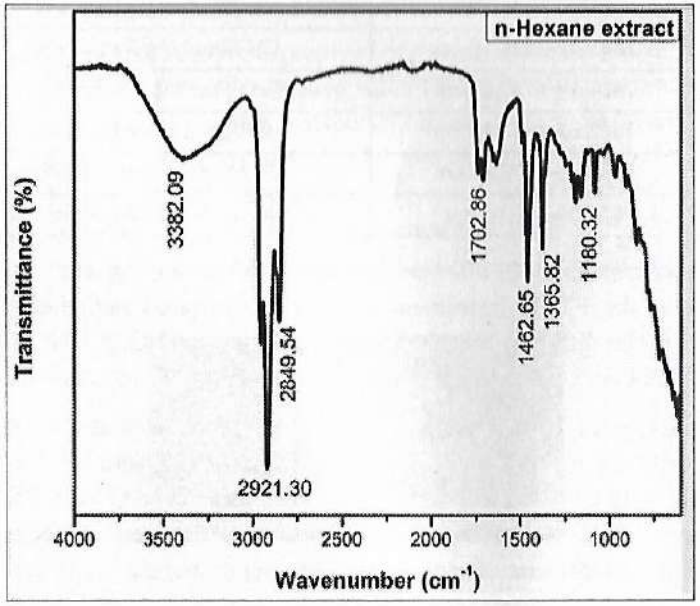

Fig 4: FT-IR spectra of hexane extract

The second sample (*C. diurnum* leaves to powder and ethanolic extract) is placed into the FT-IR instrument to give IR spectra (Figure 5). The different frequencies are observed at 3330.61 cm^{-1}, 2958.16 cm^{-1}, 2878.98 cm^{-1}, 1641.39 cm^{-1}, 1378.18 cm^{-1}, 1030.65 cm^{-1} and 871.56 cm^{-1}. The broad absorption peak finding at 3330.61 cm^{-1}, this peak represents the -OH stretch frequency. The C-H asymmetric frequency was detected at 2958.16 cm^{-1} and the C-H symmetric frequency was detected at 2878.98 cm^{-1}. The peak distinguished at 1641.39 cm^{-1}, which is accredited to the so-termed "bound". This peak is affected through carbonyl bonds [25]. The peak was detected at 1378.18 cm^{-1} indicating the -OH in-plane bending vibrations. The peak was detected at 1030.65 cm^{-1} indicating the C-O stretching frequency. Finally, the peak was detected at 871.56 cm^{-1}, which indicates the C-C stretching frequency [26, 27].

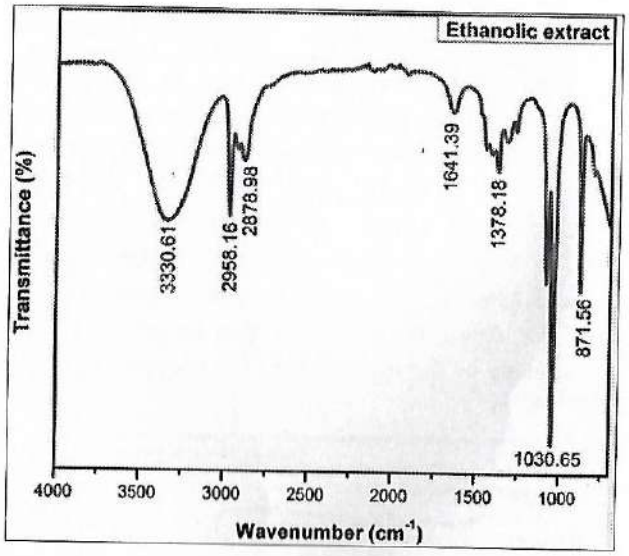

Fig 5: FT-IR spectra of ethyl alcohol extract

The third sample (*C. diurnum* leaves to powder and double-distilled water extract) is placed into the FT-IR instrument to give IR spectra (Figure 6). The different frequencies are observed at 3340.87 cm^{-1} and 1621.59 cm^{-1}. The broad absorption peak finding at 3340.87 cm^{-1}, this peak represents the -OH stretch frequency. The peak is distinguished at 1621.59 cm^{-1}, which is accredited to the so-termed "bound". This peak is affected through carbonyl bonds [25].

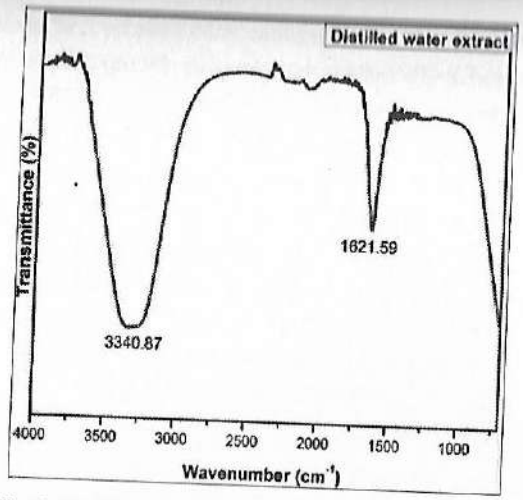

Fig 6: FT-IR spectra of double-distilled water extract

The fourth sample (*C. diurnum* leaves to powder and carbon tetrachloride extract) is placed into the FT-IR instrument to give IR spectra (Figure 7). The different frequencies are observed at 2928.10 cm^{-1}, 1730.83 cm^{-1}, 1462.49 cm^{-1}, 1378.38 cm^{-1}, and 776.98 cm^{-1}. The C-H Stretching vibration frequencies are detected at 2928.10 cm^{-1}. The C-H In-plane bending vibration frequencies (scissoring and rocking) are detected at 1462.65 cm^{-1}, and 1365.82 cm^{-1}. This frequency signifies the alkyl group present. The 'C=O' strong starching vibration frequency at 1730.83 cm^{-1}, represent the presence of the ester group. The monosubstituted absorption peak was at 787.05 cm^{-1}.

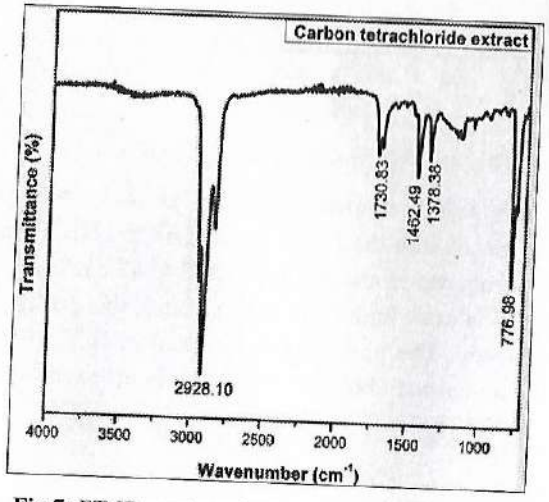

Fig 7: FT-IR spectra of carbon tetrachloride extract

The fifth sample (*C. diurnum* leaves to powder and ethyl acetate extract) is placed into the FT-IR instrument to give IR spectra (Figure 8). The different frequencies are observed at 3370.20 cm^{-1} 2913.44 cm^{-1}, 2843.71 cm^{-1}, 1716.17 cm^{-1}, 1458.09 cm^{-1}, 1378.18 cm^{-1}, 1238.88 cm^{-1} and 1035.18 cm^{-1}.

In the spectra, C=O stretching frequencies are observed at 1716.17 cm^{-1}, which represented the functional group is saturated acid. The broad absorption peak was observed at 3382.09 cm^{-1}, this peak represents the -OH stretch frequency. The C-H stretching vibration frequency is observed at (asymmetric and symmetric) 2913.44 cm^{-1} and 2843.71. cm^{-1} and the C-H in-plane bending vibration frequency (scissoring and rocking) at 1458.09 cm^{-1} and 1378.18 cm^{-1}. Hence these IR values represent the presence of the alkyl group. The strong C-O starching vibration frequency is observed at 1238.88 cm^{-1} and 1035.18 cm^{-1}.

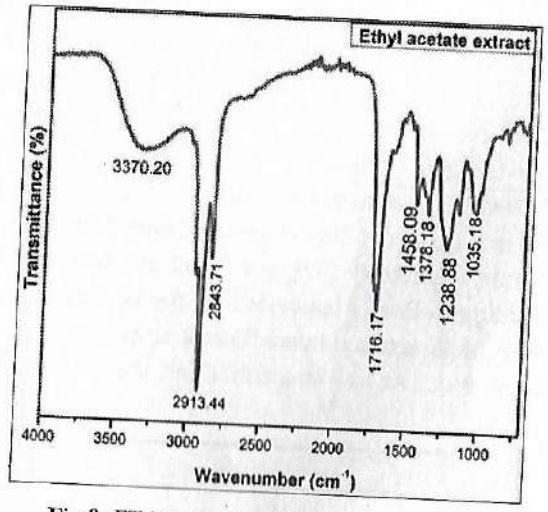

Fig 8: FT-IR spectra of ethyl acetate extract

The polar solvent extracts give the -OH stretching frequency for ethanol extract, -OH stretching frequency for double-distilled water extract, and C=O stretching frequencies (acid) for ethyl acetate extracts. The non-polar solvent extracts give the C=O stretching frequencies (acid) for hexane extract and the 'C=O' stretching frequency (ester) for carbon tetrachloride extract.

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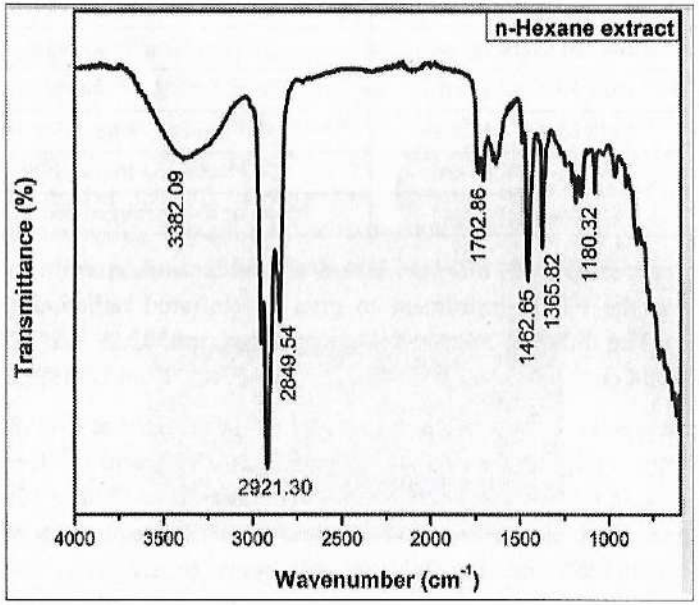

Fig 4: FT-IR spectra of hexane extract

The second sample (*C. diurnum* leaves to powder and ethanolic extract) is placed into the FT-IR instrument to give IR spectra (Figure 5). The different frequencies are observed at 3330.61 cm^{-1}, 2958.16 cm^{-1} 2878.98 cm^{-1}, 1641.39 cm^{-1}, 1378.18 cm^{-1}, 1030.65 cm^{-1} and 871.56 cm^{-1}. The broad absorption peak finding at 3330.61 cm^{-1}, this peak represents the -OH stretch frequency. The C-H asymmetric frequency was detected at 2958.16 cm^{-1} and the C-H symmetric frequency was detected at 2878.98 cm^{-1}. The peak distinguished at 1641.39 cm^{-1}, which is accredited to the so-termed "bound". This peak is affected through carbonyl bonds [25]. The peak was detected at 1378.18 cm^{-1} indicating the -OH in-plane bending vibrations. The peak was detected at 1030.65 cm^{-1} indicating the C-O stretching frequency. Finally, the peak was detected at 871.56 cm^{-1}, which indicates the C-C stretching frequency [26, 27].

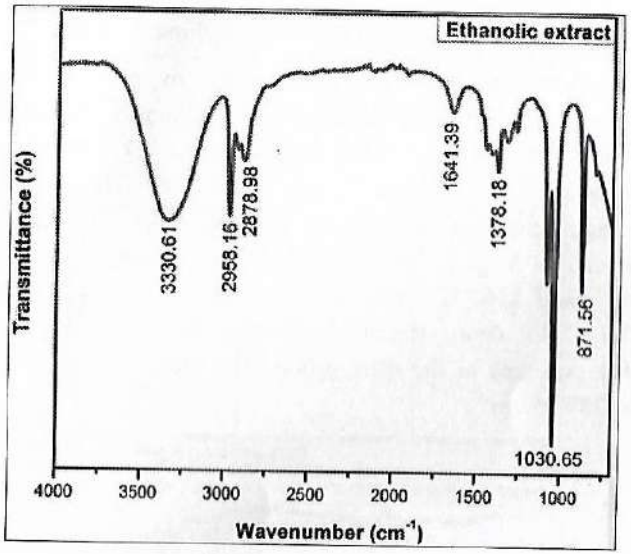

Fig 5: FT-IR spectra of ethyl alcohol extract

The third sample (*C. diurnum* leaves to powder and double-distilled water extract) is placed into the FT-IR instrument to give IR spectra (Figure 6). The different frequencies are observed at 3340.87 cm^{-1} and 1621.59 cm^{-1}. The broad absorption peak finding at 3340.87 cm^{-1}, this peak represents the -OH stretch frequency. The peak is distinguished at 1621.59 cm^{-1}, which is accredited to the so-termed "bound". This peak is affected through carbonyl bonds [25].

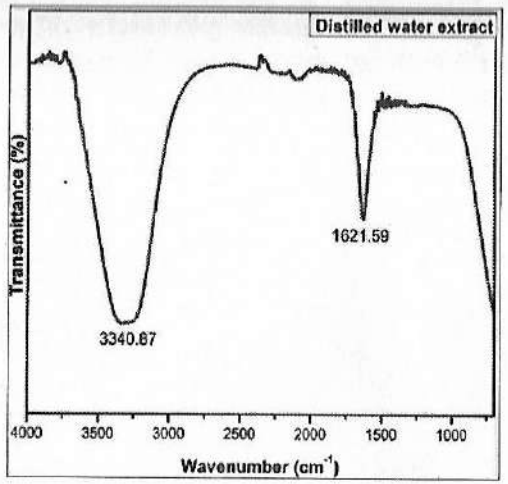

Fig 6: FT-IR spectra of double-distilled water extract

The fourth sample (*C. diurnum* leaves to powder and carbon tetrachloride extract) is placed into the FT-IR instrument to give IR spectra (Figure 7). The different frequencies are observed at 2928.10 cm^{-1}, 1730.83 cm^{-1}, 1462.49 cm^{-1}, 1378.38 cm^{-1}, and 776.98 cm^{-1}. The C-H Stretching vibration frequencies are detected at 2928.10 cm^{-1}. The C-H In-plane bending vibration frequencies (scissoring and rocking) are detected at 1462.65 cm^{-1}, and 1365.82 cm^{-1}. This frequency signifies the alkyl group present. The 'C=O' strong starching vibration frequency at 1730.83 cm^{-1}, represent the presence of the ester group. The monosubstituted absorption peak was at 787.05 cm^{-1}.

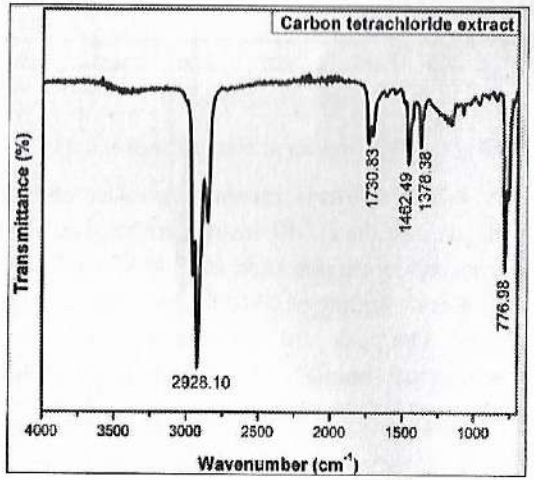

Fig 7: FT-IR spectra of carbon tetrachloride extract

The fifth sample (*C. diurnum* leaves to powder and ethyl acetate extract) is placed into the FT-IR instrument to give IR spectra (Figure 8). The different frequencies are observed at 3370.20 cm^{-1} 2913.44 cm^{-1}, 2843.71 cm^{-1}, 1716.17 cm^{-1}, 1458.09 cm^{-1}, 1378.18 cm^{-1}, 1238.88 cm^{-1} and 1035.18 cm^{-1}.

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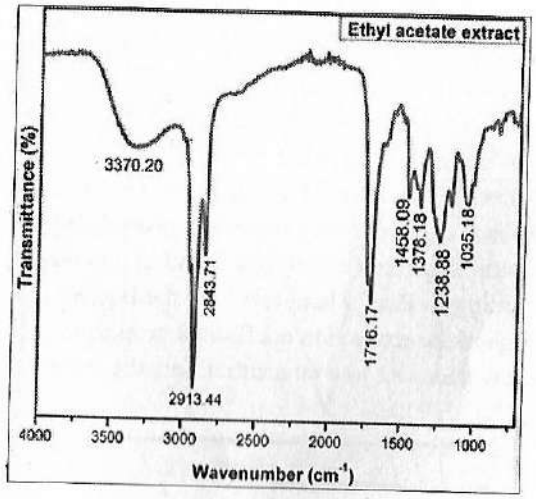

Fig 8: FT-IR spectra of ethyl acetate extract

The polar solvent extracts give the -OH stretching frequency for ethanol extract, -OH stretching frequency for double-distilled water extract, and C=O stretching frequencies (acid) for ethyl acetate extracts. The non-polar solvent extracts give the C=O stretching frequencies (acid) for hexane extract and the 'C=O' stretching frequency (ester) for carbon tetrachloride extract.

UV-Vis spectroscopy utilizes electromagnetic radiations range 200-800 nm. This range is divided into UV (200-400 nm) and visible range (400-800 nm). Generally, the visible spectrum wavelength (λ_{max}) ranges between 400-800 nm. In this range, the energy and frequency values are 3.1-3.8 EV and

750-428 Hz respectively. Wavelength is below 400 nm ultraviolet region and above 750 nm IR region is observed [28]. By using UV-Vis spectroscopy to study most organic and biological conjugated molecules. The compound contains highly conjugated double bonds, which type of compound smaller energy gap between π-π^* transitions and longer wavelength (Red or Bathochromic shifts).

The first sample (powder with hexane extract) is introduced into the UV-Vis spectrophotometer instrument to give spectra under UV radiations (Figure 9). The different wavelengths are observed at 542 nm, 560 nm, 613 nm, 647 nm, and 682 nm. All these wavelengths are detected when the molecule containing highly conjugated. The detected wavelengths like 542 nm and 560 nm, show the absorbed color is green and the visible colour is purple. These wavelengths' frequency range is 526-606 Hz and energy is between 2.17-2.50 eV. The detected wavelength like 613 nm, which shows the orange colour region is absorbed and the visible region is green-blue colour. These wavelengths' frequency range is 484-508 Hz and energy is between 2.00-2.10 eV. The detected wavelengths like 647 nm, and 682 nm, show the absorbed red colour region and the visible region colour is blue green. These wavelengths' frequency range is 400-484 Hz and energy is between 1.65-2.00 eV. The detected wavelengths (542 nm, 560 nm, 613 nm, 647 nm, and 682 nm) corresponding absorbances are 3.96, 3.92, 3.88 3.97 & 3.89. The maximum absorbance (3.97) is found at a wavelength of 674 nm (Figure 9). According to Beer's lamberts law, the highest absorbance (3.97) represents the high molar extinction coefficient or highest molar absorptivity (Є) at low concentration. At low concentrations, the lowest detection limits are detected.

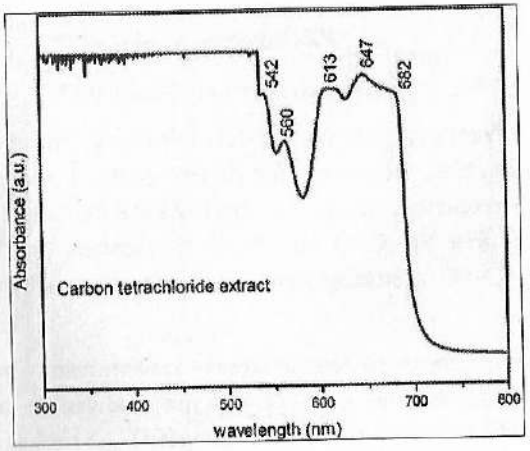

Fig 9: UV-Vis spectra of Hexane extract

The second sample (powder and ethanolic extract) is placed into the UV-Vis spectrophotometer instrument to give spectra under UV radiations (Figure 10). The different frequencies are observed at 538 nm, 608 nm, 647 nm, and 677 nm. All these wavelengths are observed when the molecule is present in high conjugation. The detected wavelength like 538 nm, which shows the absorbed green colour region, and the visible colour is purple. This wavelength's frequency range is 526-606 Hz and its energy is between 2.17-2.50 eV. The detected wavelength, like 608 nm, shows the absorbed orange colour region and the visible region is green-blue colour. These wavelengths' frequency range is 484-508 Hz and energy is between 2.00-2.10 eV. The detected wavelengths like 647 nm and 677 nm, show the absorbed colour region is red and the visible region colour is blue green. These wavelengths' frequency range is 400-484 Hz and energy is between 1.65-2.00 eV. The detected wavelengths (538 nm, 608 nm, 647 nm, and 677 nm) corresponding absorbances are 3.94, 3.47, 3.66 & 3.49. The maximum absorbance (3.94) is found at a wavelength of 538 nm. According to Beer's lamberts law, the highest absorbance (3.94) represents the high molar extinction coefficient or high molar absorptivity (Є) at low concentration. But at low concentrations, the lowest detection limits are detected.

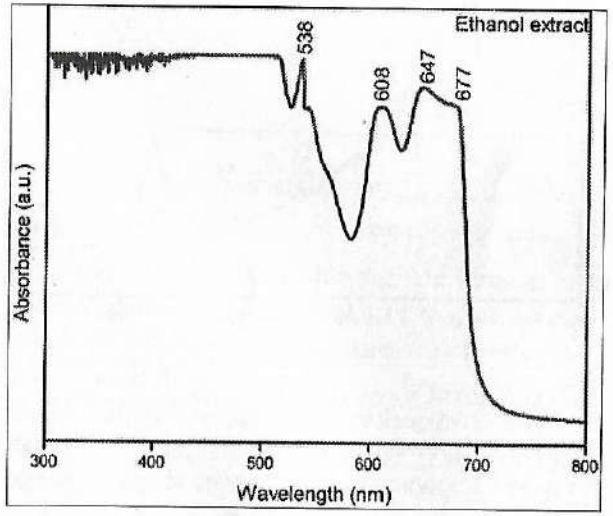

Fig 10: UV-Vis spectra of an ethyl alcohol extract

The third sample (powder and double-distilled water extract) is placed into the UV-Vis Spectrophotometer instrument to give spectra under UV radiations (Figure 11). The different wavelengths are observed at 542 nm, 612 nm, and 672 nm. All these wavelengths are observed when the molecule is highly conjugation. The detected wavelength like 542 nm, which shows

the absorbed colour region is green and the visible colour is purple. The frequency range is 526-606 Hz and the energy is between 2.17-2.50 eV. The detected wavelength like 612 nm, which shows the orange colour region is absorbed and the visible region is green-blue colour. This wavelength frequency range is 484-508 Hz and the energy is between 2.00-2.10 eV. The detected wavelength like 672 nm, which shows the red colour region is absorbed and the visible region colour is blue-green. This wavelength frequency range is 400-484 Hz and energy is between 1.65-2.00 eV. The detected wavelengths (542 nm, 612nm, and 672 nm) corresponding absorbances are 0.89, 0.63, & 1.33. The maximum absorbance (1.33) is found at a wavelength of 542 nm. According to Beer's lamberts law, the highest absorbance (1.33) represents the high molar extinction coefficient or high molar absorptivity (Є) at low concentration. But at low concentrations, the lowest detection limits are detected.

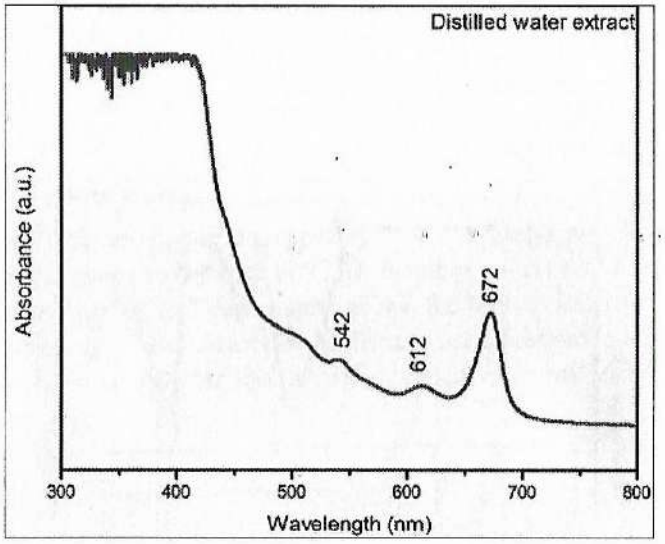

Fig 11: UV-Vis spectra of double-distilled water extract

The fourth sample (powder and carbon tetrachloride extract) is placed into the UV-Vis spectrophotometer instrument to give spectra under UV radiations (Figure 12). The different frequencies are observed at 564 nm, 597nm, and 646 nm. All these wavelengths are detected when the molecule is highly conjugation. The detected wavelengths like 564 nm, which shows the absorbed colour region is green and the visible colour is purple. This wavelength frequency range is 526-606 Hz and energy is between 2.17-2.50 eV. The detected wavelengths like 597 nm, which shows the absorbed colour region is orange and the visible region is green-blue colour. This wavelength

frequency range is 484-508 Hz and the energy is between 2.00-2.10 eV. The observed wavelengths like 646 nm, which shows the red colour region is absorbed and the visible region colour is blue green. This wavelength frequency range is 400-484 Hz and energy is between 1.65-2.00 eV. The detected wavelengths (564 nm, 597nm, and 646 nm) corresponding absorbances are 2.89, 3.54 & 3.67. The maximum absorbance (3.67) is found at a wavelength of 646 nm. According to Beer's lamberts law, the highest absorbance (3.67) represents the high molar extinction coefficient or high molar absorptivity (Є) at low concentration. At low concentrations, the lowest detection limits are detected.

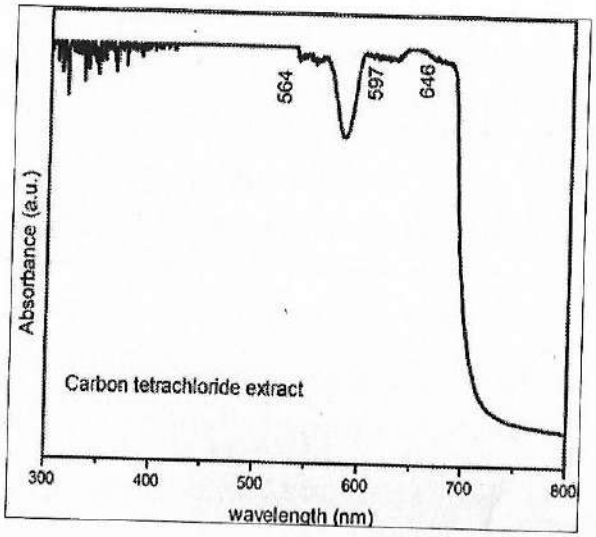

Fig 12: UV-Vis spectra of carbon tetrachloride extract

The fifth sample (powder and double-distilled water extract) is placed into the UV-Vis spectrophotometer instrument to give spectra under UV radiations (Figure 13). The different frequencies are observed at 555 nm, 648 nm, and 680 nm. All these wavelengths are detected when the molecule contains high conjugation. The detected wavelengths like 555 nm show the absorbed colour is green and the visible colour is purple. This wavelength frequency range is 526-606 Hz and energy is between 2.17-2.50 eV. The detected wavelengths like 648 nm and 680 nm, show the red colour region is absorbed and the visible region colour is blue green. This wavelength frequency range is 400-484 Hz and energy is between 1.65-2.00 eV. The detected wavelengths (555 nm, 648 nm, 680 nm) corresponding absorbances are 3.21, 3.66 & 3.42. The maximum absorbance (3.66) is found at a wavelength of 648 nm. According to Beer's lamberts law, the highest

absorbance (3.66) represents the high molar extinction coefficient or high molar absorptivity (Є) at low concentration. But at low concentrations, the lowest detection limits are detected.

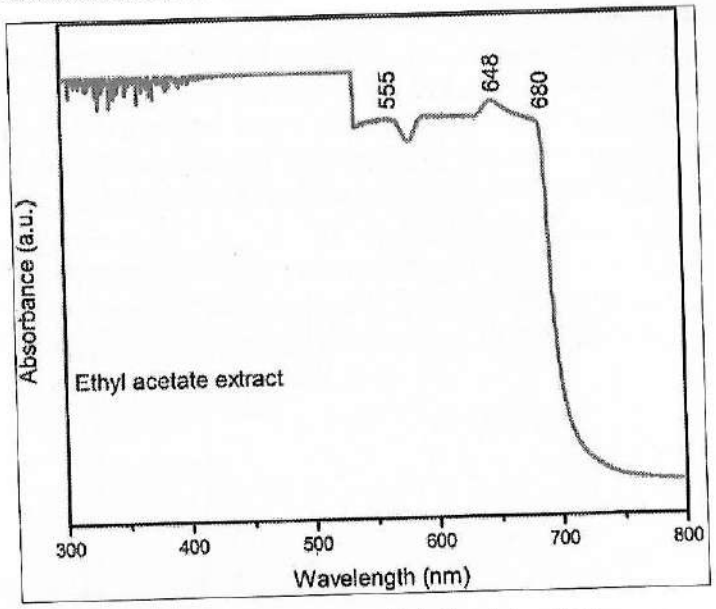

Fig 13: UV-Vis spectra of ethyl acetate extract

All the wavelengths are observed in the visible region i.e. 400-800, hence highly conjugated molecules are present.

Conclusions

The present new study was carried out to determine the frequency and wavelengths in *C. diurnum* (*C. diurnum*) leaves by using molecular spectroscopic instruments (FT-IR spectroscopy and UV-Vis spectrophotometry). The polar solvent extracts give the -OH stretch frequency for ethanol extract, -OH stretch frequency for double-distilled water extract, and C=O stretching frequencies (acid) for ethyl acetate extracts. The non-polar solvent extracts give the C=O stretching frequencies (acid) for hexane extract and the 'C=O' stretching frequency (ester) for carbon tetrachloride extract. All the wavelengths are observed in the visible region i.e., 400-800, hence highly conjugated molecules are present.

Conflict of interest

The authors have no conflicts of interest regarding this investigation.

Acknowledgments

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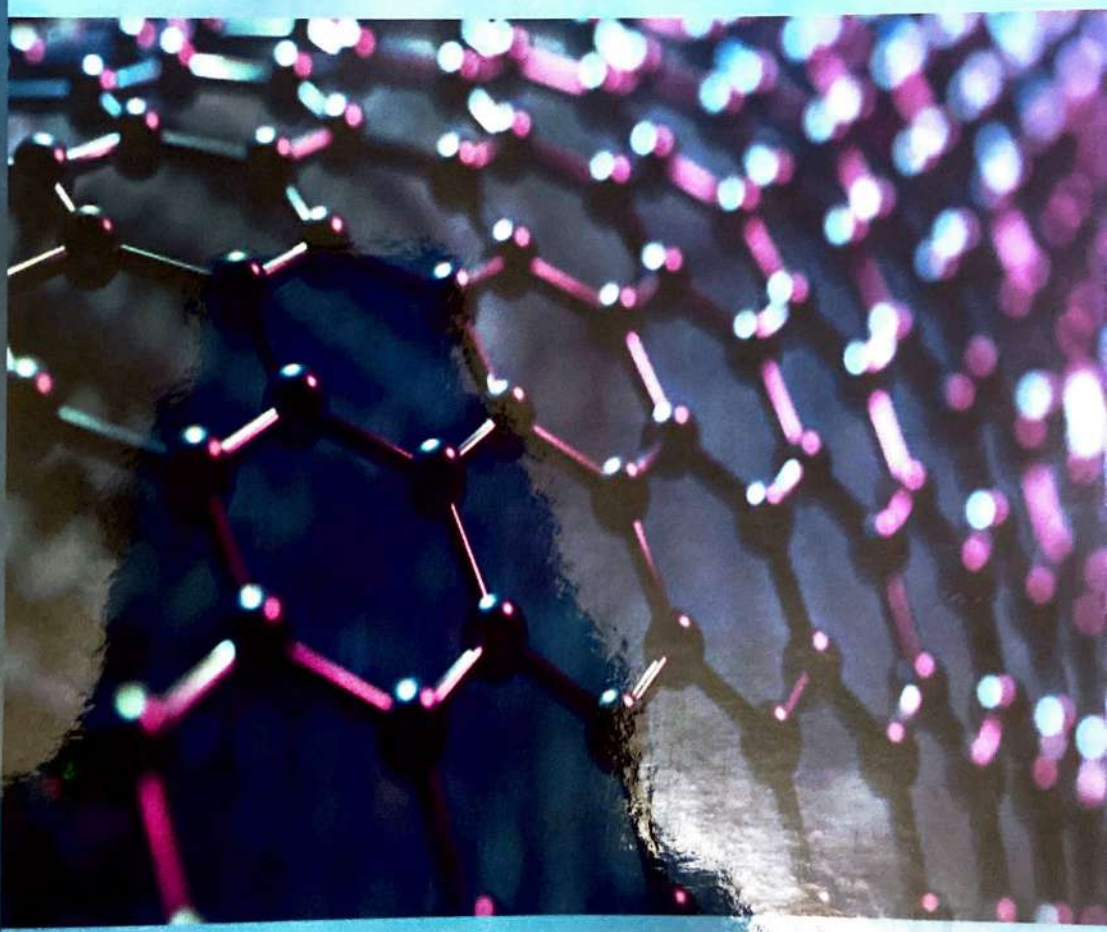

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PREFACE

Chemical, Material Sciences & Nano technology book series aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Chemical, Material Sciences & Nano technology. It also provides a premier interdisciplinary platform for researchers, practitioners, and educators to publish the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Chemical, Material Sciences & Nano technology. The field of advanced and applied Chemical, Material Sciences & Nano technology has not only helped the development in various fields in Science and Technology but also contributes the improvement of the quality of human life to a great extent. The focus of the book would be on state-of-the-art technologies and advances in Chemical, Material Sciences & Nano technology and to provides a remarkable opportunity for the academic, research and industrial communities to address new challenges and share solutions and discuss future research directions in the below field but not limited to

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PART 5

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IIP Proceedings, Volume 2, Book 12, Part 5, Chapter 1

SYNTHESIS AND CHARACTERIZATION OF LABLAB PURPUREUS DRIED LEAVE EXTRACTS

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Keywords: *Lablab purpureus leaves*, shaded dried leaves, FT-IR, UV-Vis spectrometer, Polar and non-polar solvents.

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Keywords: *Lablab purpureus leaves*, shaded dried leaves, FT-IR, UV-Vis spectrometer, Polar and non-polar solvents.

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I. INTRODUCTION

Lablab purpureus (L.) (L. *purpureus*) sweet is a normally short-lived, and summer-growing plant. It is a climbing, twining, upright, or trailing herbaceous plant that can increase to 3-6 cm in length. It gives vigorous taproot, pubescent trailing, or glabrous stems. *L. purpureus* leaves are trifoliolate and alternate. The leaves are rhomboid in shape with a length and breadth of 7.5-15 cm x 14 cm. The leaves' upper surface is very soft and short hair is present. This plant containing white to purple or blue in color with 1.5 cm in length. These plant-containing seeds are linear in shape with 4-15 cm length x 1-4 cm breadth. These plant seeds are ovoid, varying in color, dependent on cultivar or variety, normally white to brown, and few seeds are black[1-4]. *Lablab* is a flexible leguminous plant. Its young pods and seeds, and immature leaves are cooked and edible as vegetables[2-3]. *L. purpureus* seeds are used in medicine (ethnoveterinary), for example, in Kenya to treat lung and eye problems in goats and sheep.

The family name of L. purpureus (Hyacinth Bean) is Fabaceae. This tree is naturally occurring in Africa, and it is developed throughout the tropics for diet. The regular names of water are lablab-bean[5], hyacinth bean[6], Dolichos bean, sem bean, Egyptian kidney bean, *bonavist bean*, Indian bean, and Australian pea (*L. purpureus (*L). Various names of *L. purpureus* in South Asia were depicted in **Table 1**.

Table 1: Various names in South Asia

Place	Scientific Name
Gujarati	Surti Papdi
West Bengal	Sheem
Kerala	Amarakka
Tamil	mochai
Karnataka	avarekalu saaru
Maharashtra	Shravan ghevda
Andhra Pradesh/Telangana	Hyacinth bean

II. LITERATURE REVIEW

To prepare nanoparticles using purple colour *L. purpureus* flowers and silver nanoparticles and characterization. By the green approach method, carbon nanospheres are developed from *L. purpureus* using an electrode-like high-performance supercapacitor. To prepare Zinc oxide nanoparticles with *L. purpureus* leaves and analysis of its bactericidal and photocatalytic application. Identification and characterization of *L. purpureus* L. sweet (Dolichos Bean) Recombinant Inbred Lines (RIL) with elevated pod fragrance and great pod yield. To evaluate the few germplasms of L. *purpureus* beans in UP[11]. Redevelopment analysis in Dolichos bean and lablab bean genotypes. L. *purpureus* L (Hyacinth bean)-An underutilized yield as well as coming potential. L. *purpureus* L (Hyacinth bean) leaves contain polyamine levels and its relative to deficiency tolerance ·Lablab leaves used in yolk painting are representative of the food of layers and feed ingredients· A review on medical and pharmacology consequence of *L. purpureus* (Dolichos lablab)· Physico-structural variation in *L. purpureus* (L.) sweet beans. Genetic assessment of yield and concerned characters of Lablab Bean·Utilization capacities of *L. purpureus* (L.) sweet and the

restrictions of field insects and infections in Nigeria. Consequences of leaf production on natural protein and ore contents of initial growing contours of lablab. Evaluation of natural variety of *L. purpureus* (L.) sweet (Kenyan Dolichos bean) utilizing SSR (simple sequence repeat) indicators. Molecular diversity of L. *purpureus* (L.) sweet (Kenyan lablab bean) accesses applying expanded piece size polymorphism indicators. Influence of plant density on food produce and quality of lablab bean and intercropped corn. Natural diversity evaluation in *L. purpureus* L (Dolichos Bean) centered on fundamental element assessment and individual connection cluster evaluation. A over review on medical status and pharmacology *L. purpureus* (Dolichos lablab). To prepare semi crude peptide of lablab bean to analyze the antimicrobial activity. Molecular and agronomical estimation of six *L. purpureus* L. (lablab bean) cultivars. To study conformity of vicilin from Phaseolus calcaratus and Dolichos lablab by using various scanning calorimetry and FT-IR spectroscopy. Structure, composition, morphology, and physicochemical things of a navy bean, lablab bean, tepary bean velvet bean, and rice bean starches. A protein (carbohydrate-binding) from the cooked lablab beans successfully acts against the diseases of SARS-CoV-2 and influenza viruses. An analysis of the properties of starch separated from three kinds of L. *purpureu*s seed

Now present researcher investigates to identify the functional groups in *L. purpureus* leaves with various solvents (ethanol, ethyl acetate, hexane, and carbon tetrachloride) by using FT-IR spectroscopy.

III. MATERIALS AND METHODS

1. **Materials:** The HPLC grade solvents (ethanol, ethyl acetate, hexane, and carbon tetrachloride) were purchased by Merck Company from Mumbai.

2. **Collection and preparation of powder with Lablab purpureus (*L. purpureus*) leaves:** To collect *L. purpureus* leaves (***Figure 1a***) in the winter season (December 2021-March 2022) from Kaza village, Movva Mandalam, Krishna district, A.P India. These leaves wash through distilled water and dry in shadows for 25-30 days (**Figure 1b**). After 25-30 days these dried leaves mix with mechanical Shakar up to amorphous powders (**Figure 1c**).

Figure 1: a) *L. purpureus* leaves, b) Shaded dried leaves, c) Shaded dried leaves powder.

3. **Formulation *L. purpureus* leaves extract with various solvents:** To prepare five types of extracts (Hexane, ethanol, double-distilled water, carbon tetrachloride, and ethyl acetate) using dried powder. This extract was stored in sealed bottles at 5 ^{o}C for further

usage **Figure 2**.

Figure 2: *L. purpureus* leaves extract with different solvents like hexane (1), ethanol (2), double-distilled water (3), carbon tetrachloride (4), and ethyl acetate (5).

4. **Characterization of *L. purpureus* leaves extract:** To identify the functional group in different samples by using an instrument is like FT-IR spectroscopy. Compound (chemical bond) absorbed incident light radiation to get an infrared absorption spectrum. To determine the chemical bond in the molecule by using this interpretation spectrum. Prepare five types of extracts (Hexane, ethanol, double-distilled water, carbon tetrachloride, and ethyl acetate) using dried powder. The prepared extracts were inserted in FT-IR spectroscopy (FT-IR5300, JASCO), with wavelength range from 400 to 4000 cm^{-1} and 4 cm^{-1} resolution.

IV. RESULTS AND DISCUSSION

1. **FT-IR Spectral analysis:** The prepared series (five) of extracts were placed into FT-IR spectroscopy to give series (five) spectra at various frequencies as shown in (**Figures 3-7**). These spectra give various peak values and the feasible functional groups described in the samples. Based on the ratio of the peak, components were separated. The out coms of FT-IR evaluation obeyed the presence of aromatic compounds, alcohol, aldehyde, and ester .

The FT-IR spectra are shown (**Figure 3**) various peaks at different frequencies in hexane and *L. purpureus* dried leaves powder extract. These spectral peaks observed at frequencies 2923.70 cm^{-1}, 2843.79 cm^{-1}, 1711.04 cm^{-1}, 1452.96 cm^{-1}, 1373.05 cm^{-1}, 1184.62 cm^{-1}, 1080.51 cm^{-1}, 985.51 cm^{-1}, 841.50 cm^{-1} (**Table 2**).

The peaks were observed at frequencies 2923.70 cm^{-1}, and 2843.79 cm^{-1} representing the OH stretching vibrational frequencies. The peaks at frequencies 2923.70 cm^{-1} and 2843.79 cm^{-1} are asymmetric starching frequencies and starching frequencies. asymmetric starching frequencies have a greater dipole moment than the symmetric starching frequencies, hence asymmetric starching frequencies are more than symmetric starching frequencies. The peak was observed at 1452.96 cm^{-1} and 1373.05 cm^{-1} representing the in-plane bending vibrations i.e., scissoring and rocking. The main functional group is observed at frequency 1711.04 cm^{-1} representing the "C=O" stretching frequency which represents the carboxylic acid as a functional group. The C-O

stretching frequencies are observed at 1184.62 cm^{-1} and 1080.51 cm^{-1}, which represents the alkoxy group, and finally, two bands are observed at 985.51 cm^{-1} and 841.50 cm^{-1}, which represents the OH out plane bending vibrations i.e., waging and twisting.

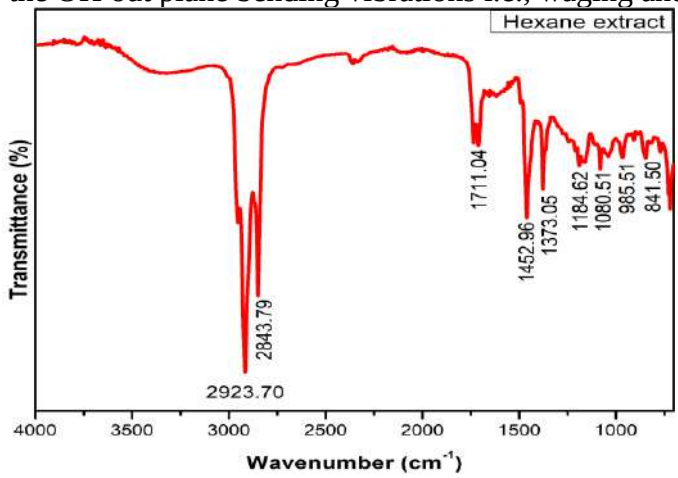

Figure 3: FT-IR spectra obtained by hexane and *L. purpureus* dried leaves powder extract.

The FT-IR spectra are shown (**Figure 4**) various finding peaks at different frequencies in Ethanol and *L. purpureus* dried leaves powder extract. These spectral peaks observed at 3350.41 cm^{-1}, 2938.36 cm^{-1}, 2843.79 cm^{-1}, 1612.06 cm^{-1}, 1392.84 cm^{-1}, 1035.79 cm^{-1} (**Table 2**).

The peaks were observed at 2938.36 cm^{-1}, and 2843.79 cm^{-1} representing the CH stretching vibrational frequencies. The peaks at 2938.36 cm^{-1} and 2843.79 cm^{-1} are asymmetric starching frequencies and starching frequencies. asymmetric starching frequencies have a greater dipole moment than the symmetric starching frequencies, hence asymmetric stretching frequencies are more than symmetric stretching frequencies. The peak was observed at 1392.84 cm^{-1} representing the N-H in-plane bending vibration. The main functional group is observed at 1612.06 cm^{-1} representing the "C=O" stretching frequency which represents the Amide as a functional group. The C-N stretching frequencies are observed at 1035.79 cm^{-1} which represents the C-N bond is present.

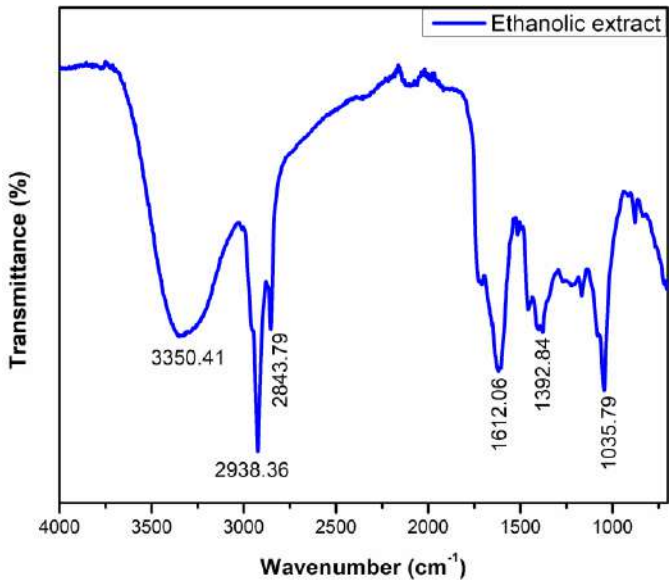

Figure 4: FT-IR spectra with ethanol and *L. purpureus* dried leaves powder extract

In **Figure 5** shown various peaks of FT-IR spectra at different frequencies in double distilled water and *L. purpureus* dried leaves powder extract. These spectral peaks observed at 3275.53 cm^{-1}, 2068.88 cm^{-1}, 1636.24 cm^{-1} (**Table 2**).

The peak frequencies found were at 3275.53 cm^{-1}, and 2843.79 cm^{-1} representing the NH stretching vibrational frequencies. The main functional group is observed at 1636.24 cm^{-1} representing the "C=O" stretching frequencies in Amide as a functional group. The C-N stretching frequencies are observed at 2068.88 cm^{-1} which represents the C=N stretching frequencies.

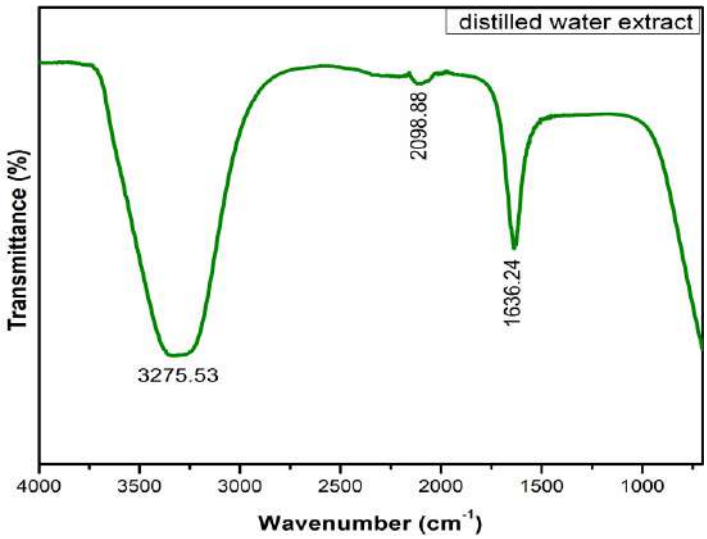

Figure 5: FT-IR spectra with double distilled water and *L. purpureus* dried leaves powder extract.

The FT-IR spectra are shown (**Figure 6**) various peaks at different frequencies in Carbon tetrachloride and *L. purpureus* dried leaves powder extract. To finding the spectral peaks at 2928.10 cm^{-1}, 2854.03 cm^{-1}, 1746.23 cm^{-1}, 1472.76 cm^{-1}, 1378.18 cm^{-1}, 1159 cm^{-1} (**Table 2**).

The peaks were observed at frequencies 2928.10 cm^{-1}, and 2854.03 cm^{-1} representing the CH stretching vibrational frequencies. The peaks at 2928.10 cm^{-1} and 2854.03 cm^{-1} are asymmetric starching frequencies and starching frequencies. asymmetric starching frequencies have a greater dipole moment than the symmetric starching frequencies, hence asymmetric starching frequencies are more than symmetric starching frequencies. The peak was observed at 1472.76 cm^{-1} and 1378.18 cm^{-1} representing the in-plane bending vibrations i.e scissoring and rocking. The main functional group is observed at 1746.23 cm^{-1} representing the "C=O" stretching frequency which represents the ester as a functional group. The C-O stretching frequencies are observed at 1159 cm^{-1} and 1080.51 cm^{-1}, which represents the alkoxy group.

The FT-IR spectra are shown in **Figure 7** various peaks at different frequencies in Ethyl acetate and *L. purpureus* dried leaves powder extract. These spectral peaks observed at 3276.36 cm^{-1}, 2928.10 cm^{-1}, 2838.65 cm^{-1}, 1710.51 cm^{-1}, 1378.18 cm^{-1}, 1238.88 cm^{-1}, 1040.19 cm^{-1} (**Table 2**).

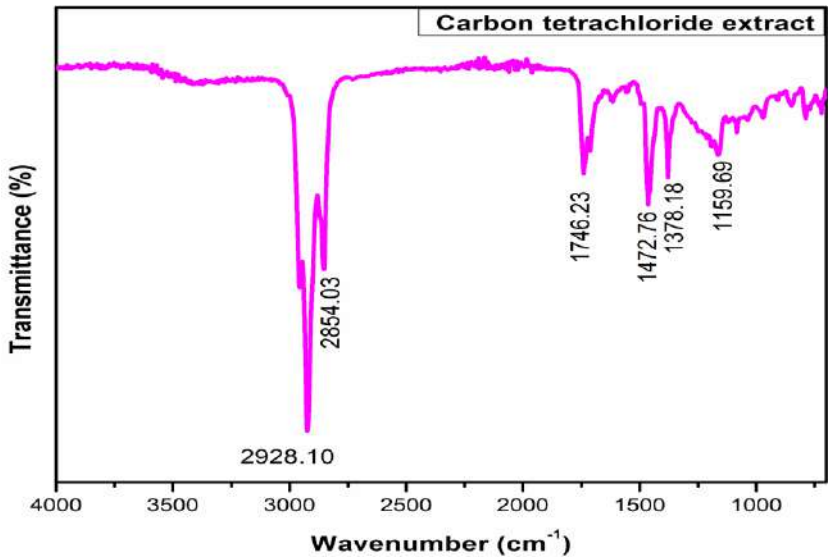

Figure 6: FT-IR spectra with carbon tetra chloride and *L. purpureus* dried leaves powder extract.

The peaks were observed at 2928.10 cm^{-1}, and 2838.65 cm^{-1} representing the OH stretching vibrational frequencies. The peaks at 2928.10 cm^{-1} and 2838.65 cm^{-1} are asymmetric stretching frequencies and stretching frequencies. asymmetric stretching frequencies have a greater dipole moment than the symmetric starching frequencies, hence asymmetric starching frequencies are more than symmetric stretching frequencies. The peak was observed at frequencies 1378.18 cm^{-1} and 1238.88 cm^{-1} representing the OH in-plane bending vibrations i.e. scissoring and rocking. The main functional group is

observed at 1710.51 cm^{-1} representing the "C=O" stretching frequency which represents the carboxylic acid as a functional group. The C-O stretching frequency is observed at 1040.19 cm^{-1}, which represents the alkoxy group.

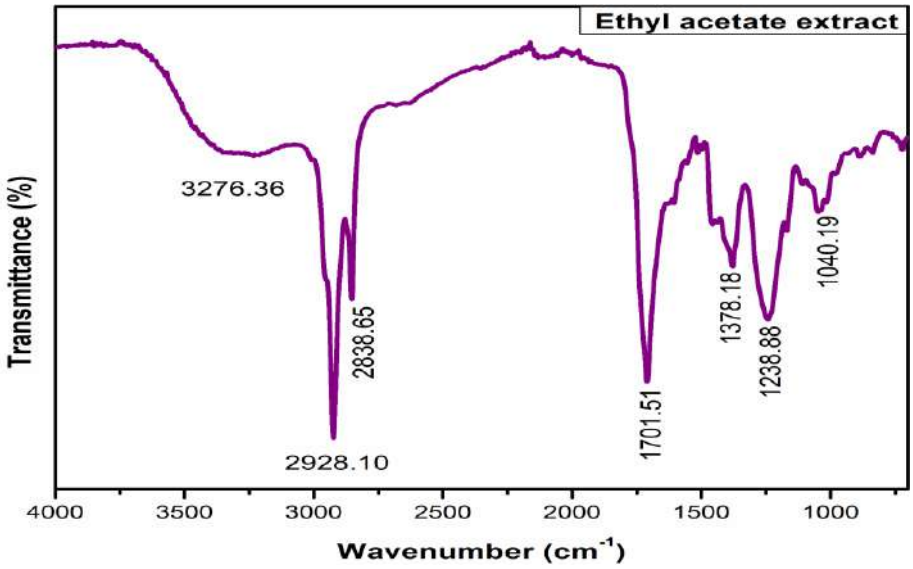

Figure 7: FT-IR spectra with ethyl acetate and *L. purpureus* dried leaves powder extract.

Table 2: FT-IR spectral analysis of *L. purpureus* dried leaves to powder and different solvent extracts.

Sl. no.	Spectral values	Functional groups
Powder extract with Hexane		
1	2923.70 cm^{-1} and 2843.79 cm^{-1}	OH, asymmetric and asymmetric starching frequencies
2	1452.96 cm^{-1} and 1373.05 cm^{-1}	OH, in-plane bending vibrations
3	1711.04 cm^{-1}	"C=O" stretching frequency
4	1184.62 cm^{-1} and 1080.51 cm^{-1}	C-O stretching frequencies
5	985.51 cm^{-1} and 841.50 cm^{-1}	out plane bending vibrations
Powder extract with Ethanol		
6	2938.36 cm^{-1}, and 2843.79 cm^{-1}	CH, asymmetric and asymmetric starching frequencies
7	1392.84 cm^{-1}	N-H in-plane bending vibrations
8	1612.06 cm^{-1}	"C=O" stretching frequency
9	1035.79 cm^{-1}	C-N stretching frequency
Powder extract with Double distilled water		
10	3275.53 cm^{-1}, and 2843.79 cm^{-1}	NH stretching vibrational frequencies
11	1636.24 cm^{-1}	"C=O" stretching frequency
12	2068.88 cm^{-1}	C=N stretching frequency
Powder extract with Carbon tetrachloride		

13	2928.10 cm^{-1}, and 2854.03 cm^{-1}	CH, asymmetric and asymmetric starching frequencies
14	1472.76 cm^{-1} and 1378.18 cm^{-1}	CH, in-plane bending vibrations
15	1746.23 cm^{-1}	"C=O" stretching frequency
16	1159 cm^{-1} and 1080.51 cm^{-1}	C-O stretching frequencies
Powder extract with Ethyl acetate		
17	2928.10 cm^{-1}, and 2838.65 cm^{-1}	-OH stretching vibrational frequencies
18	1378.18 cm^{-1} and 1238.88 cm^{-1}	-OH, in-plane bending vibrations
19	1710.51 cm^{-1}	"C=O" stretching frequency
20	1040.19 cm^{-1}	C-O stretching frequency

2. **UV-Visible spectral analysis:** The electromagnetic radiations range in UV-Vis spectrophotometry is 200-800 nm. This range is split into two regions, one is the UV range (200-400 nm) and the second one is the visible range (400-800 nm). Organic, biological, and conjugated molecules are studied by UV-Vis spectrophotometry.

The prepared *L. purpureus* dried leaves with hexane extract was passed into the UV-VIS spectrophotometer (**Figure 8**). The results of hexane extract were detected wavelengths at 647 nm and 682 nm and corresponding absorbance at 3.66 and 3.42. These wavelengths (647 nm and 682 nm) give information about the frequency range being between 400-484 Hz and energy range being between 1.65-2.00 eV and also given the absorbed red color region and the visible region color is blue-green. According to Beer's lamberts law, the highest absorbance (3.66) value represents the highest molar absorptivity or high molar extinction coefficient at minimum concentration. At a minimum concentration, the smallest detection limits are detected. These wavelengths and absorbance values represent the biomolecules and highly conjugated molecules (Note: here scale range from 300- 800 nm are measured).

The prepared *L. purpureus* dried leaves with ethanol extract was passed into the UV-Vis spectrophotometer (**Figure 9**). The results of ethanol extract were detected wavelengths at 215 nm, 275 nm, 415 nm, and 660 nm, and the corresponding absorbance at 1.635, 0.718, 0.380, and 0.136. The UV region wavelengths at 215 nm and 275 nm give the information simple organic n-π^* molecule. The visible region wavelengths at 415 nm and 660 nm give information about highly conjugated organic molecules. According to Beer's lamberts law, the highest absorbance (1.635) value represents the highest molar absorptivity or high molar extinction coefficient at minimum concentration. At a minimum concentration, the smallest detection limits are detected. These wavelengths and absorbance values represent the biomolecules and highly conjugated molecules.

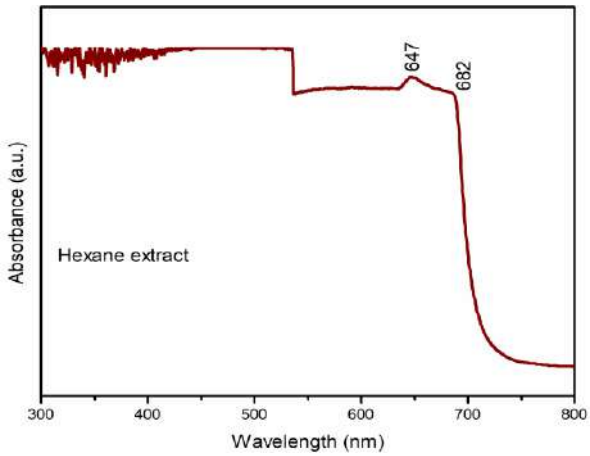

Figure 8: UV-Vis spectra of Hexane extract.

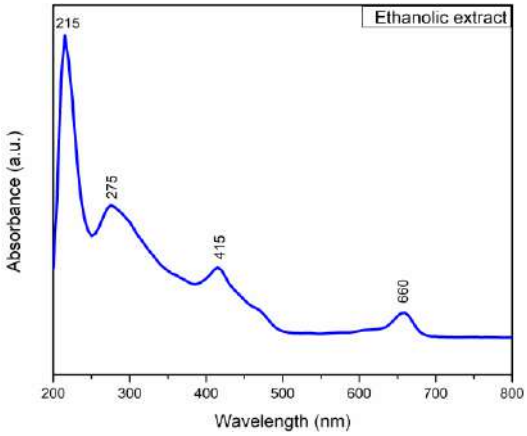

Figure 9: UV-Vis spectra of Ethanol extract.

The prepared *L. purpureus* dried leaves with double distilled water extract was passed into the UV-Vis spectrophotometer (**Figure 10**). The results of the double distilled water were detected wavelengths at 219.27 nm, and 272.17 nm, and the corresponding absorbance at 0.040, and 0.003. The UV region wavelengths at 219.27 nm and 272.17 nm give the information simple organic n-π* molecule. According to Beer's lamberts law, the highest absorbance (0.040) value represents the highest molar absorptivity or high molar extinction coefficient at minimum concentration. At a minimum concentration, the smallest detection limits are detected. These wavelengths and absorbance values represent the biomolecules and highly conjugated molecules.

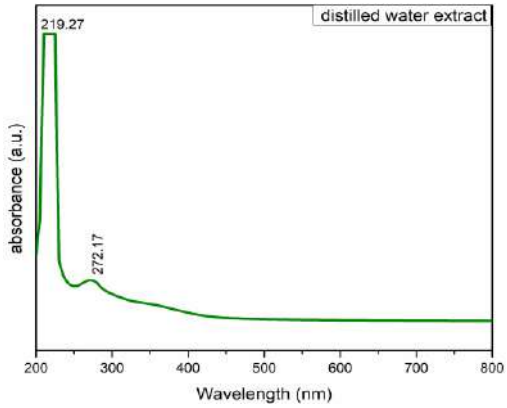

Figure 10: UV-Vis spectra of Double-distilled water extract.

The prepared *L. purpureus* dried leaves with carbon tetrachloride extract was passed into the UV-Vis spectrophotometer (**Figure 11**). The results of the carbon tetrachloride extract were detected wavelengths at 260 nm, 418 nm, 455 nm, and 665 nm, and the corresponding absorbance at 0.839, 1.023, 0.783, and 0.538. The UV region wavelengths at 260 nm give the information simple organic n-π* molecule. The visible region wavelengths at 418 nm, 455 nm, and 665 nm give information about highly conjugated organic molecules. According to Beer's lamberts law, the highest absorbance (1.023) value represents the highest molar absorptivity or high molar extinction coefficient at minimum concentration. At a minimum concentration, the smallest detection limits are detected. These wavelengths and absorbance values represent the biomolecules and highly conjugated molecules.

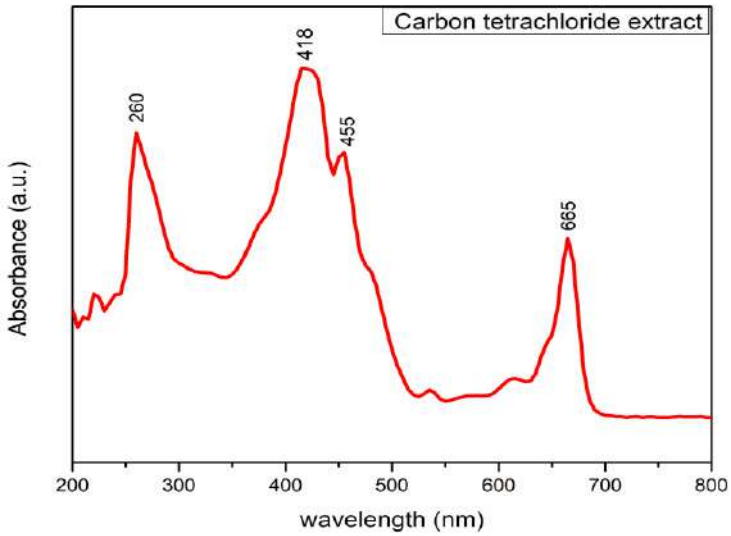

Figure 11: UV-Vis spectra of Carbon tetrachloride extract.

The prepared *L. purpureus* dried leaves with ethyl acetate extract was passed into the UV-Vis spectrophotometer (**Figure 12**). The results of the ethyl acetate extract were detected wavelengths at 273 nm, 413 nm, and 665 nm, and the corresponding absorbance at 0.33, 0.618, and 0.205. The UV region wavelengths at 273nm give the information simple organic n-π* molecule. The visible region wavelengths at 413 nm and 665 nm give information about highly conjugated organic molecules. According to Beer's

lamberts law, the highest absorbance (0.618) value represents the highest molar absorptivity or high molar extinction coefficient at minimum concentration. At a minimum concentration, the smallest detection limits are detected. These wavelengths and absorbance values represent the biomolecules and highly conjugated molecules.

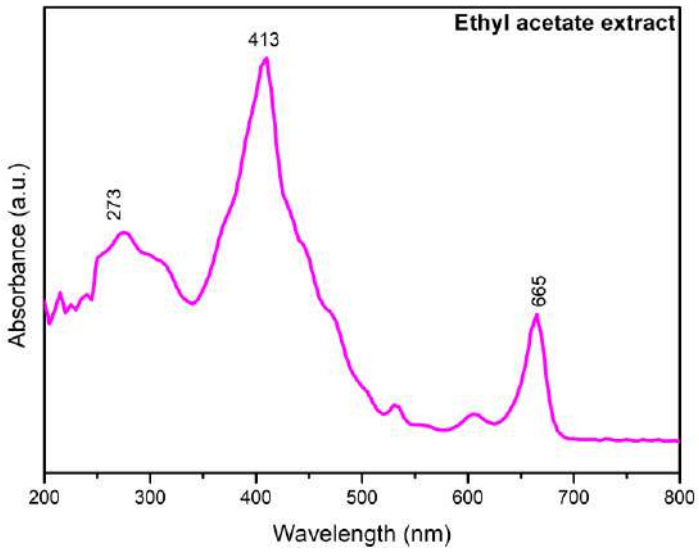

Figure 12: UV-Vis spectra of ethyl acetate extract.

V. CONCLUSION

In the present research, the investigation identified the functional group in *L. purpureus* leaves by using FT-IR spectroscopy and UV-Vis spectrophotometer. To prepare five types of extracts using solvents like hexane, ethanol, double-distilled water, carbon tetrachloride, and ethyl acetate with dried powder. The FT-IR spectra give various peaks at different frequencies in synthesized extracts showing a different functional group with stretching frequencies which represents the carboxylic acids, amides, esters, etc. and also obtained absorbance values corresponding wavelengths from UV-Vis spectrophotometer. From the spectral results, the presence of absorption peaks may be arising due to active biomolecules in the leaf extract with various solvents.

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National Seminar on

SOCIO - ENVIRONMENTAL ISSUES AND SUSTAINABLE DEVELOPMENT

EDITOR

Dr. P. Brahmaji Rao

UGC Sponsored

Two Day National Seminar

on

Socio-Environmental Issues and Sustainable Development

6th & 7th March, 2023

ज्ञान-विज्ञान विमुक्तये

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ANDHRA PRADESH

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MESSAGE

Socio Environmental issues obviously speak for sustainable development. "Environmental Justice' is the Social Justice and it is the clarion call of all the nations in the world. Happy to know that the Dept. of Environmental Sciences is organising two day national seminar on 'Socio-Environmental Issues and Sustainable Development' during 6th & 7th March, 2023.

I Congratulate the Director of the Seminar and the HoD for initiating this responsibility and I wish the seminar grand success.

(Prof. RAJA SEKHAR, P)

Editorial

The Department of Environmental Sciences, Acharya Nagarjuna University, Guntur is organizing two day **National Seminar on Socio-Environmental issues and Sustainable Development on 6th & 7th March'2023** which is sponsored by University Grants Commission(UGC), New Delhi. The unplanned haphazard growth and development of cities across the country might be fuelling the devastation due to natural calamities including impact of environmental degradation, climate change and loss of bio-diversity. Our Department has been organizing such events and days of significance on regular basis on the themes of climate, waste management, environment health and disaster management etc.

The objective of the conference is to have discussion on issues and challenges of Socio-economic, Environmental and Sustainable development in the era of Global warming and Climate change etc including discussion on policies of environmental resilience, reduction of Carbon footprints, SLWM, Green trading and emerging technologies for promotion of renewable resources etc. Further, these consultation/deliberations will be given a good opportunity for academicians, practitioners and researchers.

Climate change, pollution and nature loss, directly impacts a broad range of rights of food, health, development and the very right to life. Universal Declaration of Human Rights of gender, are endowed by virtue of their humanity and human dignity. However, climate change, biodiversity and habitat loss, and pollution threats to destroy lives, economies, and entire cultures and societies. These devastating and interlocking environmental emergencies harm human rights, including the rights to life, health, food, water and sanitation, culture, self-determination, and many others, with differential effects on the basis of gender.

Protection of the environment is necessary enabling condition for the effective enjoyment of human rights enshrined in treaties including the human right to a safe, clean, healthy and sustainable environment contained in the constitution, laws, policies and regional agreements adopted by more than 15 states. Article 21 of the Indian constitution provides for the fundamental right of life. Fulfilling these rights requires ensuring a safe and stable climate, the conservation of biodiversity and ecosystems. Socio-environmental Issues and Sustainable Development is a key concept that provides an answer to the question of how humankind coexists with the earth and with nature. Organizers hope that the discussions and deliberations during the seminar will come up with concrete action plans and remedial measures to some extent to resolve the issue of conflict between socio-environmental issues and sustainable development.

Editor & Seminar Director

Dr. P. BRAHMAJI RAO

CONTENTS

A Review on Improving Soil Quality for Sustainable Agriculture Production

Dr. V. Subhashini, D.A. Kiranmayee and K. Padmaja
Department of Zoology
AG & SG Siddhartha Degree College, Vuyyuru

Abstract

Soil fertility is the ability of soil to sustain plant growth and optimize crop yield.Advancing food security and environmental sustainability in farming systems requires an integrated soil fertility management approach that maximizes crop production, while minimizing the mining of soil nutrient reserves and the degradation of the physical and chemical properties of soil can lead to land degradation, including soil erosion. This can be enhanced through use of fertilizers,organic inputs, crop rotation with legumes and the use of improved germplasm, combined with the knowledge on how to adapt these practices to local conditions.

The various chemical, physical, and biological properties of a soil interact in complex ways that determine its capacity to produce healthy and nutritious food. The integration of these properties and the resulting level of productivity is referred to as "soil quality". Soil quality is often adversely affected by soil degradative processes such as soil erosion, salinization, and desertification. There is a growing consensus that the concept of soil quality should not be limited to soil productivity, but should be extended to include the attributes of environmental quality, human and animal health, and food safety and quality. In fact, our knowledge of how soil microorganisms affect food quality, environmental quality and human and animal health is rather limited. Future research should seek to identify, and quantify reliable and meaningful biological ecological indicators of soil quality, including total species diversity, or genetic diversity of beneficial soil microorganisms and how they relate to the sustainability of agricultural systems.

Key words: Soil fertility, Soilquality, Soilproductivity, Sustainable practices

Introduction:

India has about 160 million hectares of arable land. But nearly sixty percent of this soil is labelled as distressed soil. That means in another twenty five to thirty years' time, we may not be able to grow the food that we need in this Nation.The most incredible is that without any technology, just with traditional knowledge, our farmers have been feeding over one billion people all these years. But unfortunately,the farming community is not given much importance, where farmers do not want their children to go into farming. On one hand, we are losing the quality of the soil, and on another, farmers are not putting their next generation into farming. It means in another 25 years we are definitely headed by a major crisis.

People have come to understand that agriculture should not only be high yielding, but alsosustainable (Reynolds and Borlaug 2006). Farmers concerned about the environmental sustainabilityof their crop production systems combined with ever-increasing production costs have begun to adoptand adapt improved system management practices which lead to the ultimate vision of sustainableagriculture.

Conservation agriculture has been proposed as a widely adapted set of management principles that can assure more sustainable agricultural production.

Rich Soil – The Most Precious Gift

The only source of water we have in a tropical nation is the monsoon. The monsoon comes down upon us over a span of forty-five to sixty days. This water that comes down in sixty days, have to be preserved in the soil for 365 days to feed the rivers, lakes and aquifiers.The only reason why water stays in the soil is because there is rich organic content. The leaves of the trees and animal waste are the source of this organic content. Where there are no trees and animal waste, the soil cannot hold water- it will flow away. Hence without substantial vegetation this cannot be possible.

Importance of soil

It preserves clean water and helps regulate the climate. Soil degradation reduces agricultural yields and threatens farmers' livelihoods. Soil that has been leached of its nutrients cannot support crops, or plants that prevent desertification.

Soil provides nutrients, water and minerals to plants and trees, stores carbon and is home to billions of insects, small animals, bacteria and many other micro-organisms.

Soil provides ecosystem services critical for life: soil acts as a water filter and a growing medium; provides habitat for billions of organisms, contributing to biodiversity; and supplies most of the antibiotics used to fight diseases.

Soil filters the water we drink, grows the food we eat, and captures the carbon dioxide that causes climate change. Soil is the largest carbon sink after the ocean and holds more carbon than all terrestrial plant life on the plan

These soil functions include air quality and composition, temperature regulation, carbon and nutrient cycling, water cycling and quality, natural "waste" (decomposition) treatment and recycling, and habitat for most living things and their food.

Soil provides a foothold for the plant roots; as a result, plants can withstand extreme conditions throughout their growth. The soil dissolves essential minerals and nutrients in the soil water. Soil water is important for photosynthesis (a process that results in the manufacture of sugars).Soil the real wealth of the Nationis depleting at an alarming rate. This will lead to a drop in nourishment levels and water crisis

Causes and Effects of Soil Degradation

Soil degradation is mostly due to decline in soil fertility, adverse changes in alkalinity, acidity or salinity, extreme flooding, use of toxic soil pollutants, erosion, and deterioration of the soil's structural condition. These elements contribute to a significant amount of soil quality depreciation annually. Excessive soil degradation thus gives rise to immediate and long-term impacts.

Physical factors

There are several physical factors like rainfall, surface runoff, floods, wind erosion, tillage, and mass movements that change the natural composition and structure of the soil and result in the loss of fertile top spoil thereby declining soil quality.

All these physical factors produce different types of soil erosion (mainly water and wind erosion) and soil detachment actions, and their resultant physical forces eventually change the composition and structure of the soil by wearing away the soil's top layer as well as organic matter. In the long-term, the physical forces and weathering processes lead to the decline in soil fertility and adverse changes in the soil's composition/structure.

2. Biological Factors

Biological factors refer to the human and plant activities that tend to reduce the quality of the soil. Some bacteria and fungi overgrowth in an area can highly impact the microbial activity of the soil through biochemical reactions, which reduces crop yield and the suitability of soil productivity capacity. .Human activities such as poor farming practices may also deplete soil nutrients thus diminishing soil fertility. The biological factors affect mainly lessens the microbial activity of the soil.

3. Chemical Factors

The reduction of soil nutrients because of alkalinity or acidity or water are the chemical components of soil degradation. They bring alterations in the soil's chemical property that determines nutrient availability.It is mainly caused by salt build-up and leaching of nutrients which corrupt the quality of soil by creating undesirable changes in the essential soil chemical ingredients. These chemical factors normally bring forth the irreversible loss of soil nutrients and production capacities such as the hardening of iron and aluminium-rich clay soils into hardpans.

Misuse or excess use of fertilizers

The excessive use and the misuse of pesticides and chemical fertilizers kill organisms that assist in binding the soil together. Most agricultural practices involving the use of fertilizers and pesticides often entail misuse or excessive application, thereby contributing to the killing of soil's beneficial bacteria and other micro-organisms that help in soil formation.

The complex forms of the fertilizer's chemicals are also responsible for denaturing essential soil minerals, giving rise to nutrient losses from the soil. Therefore, the misuse or excessive use of fertilizers increases the rate of soil degradation by destroying the soil's biological activity and builds up of toxicities through incorrect fertilizer use.

6. Industrial and Mining activities

Soil is chiefly polluted by industrial and mining activities. As an example, mining destroys crop cover and releases a myriad of toxic chemicals such as mercury into the soil thereby poisoning it and rendering it unproductive for any other purpose.

Industrial activities, on the other hand, release toxic effluents and material wastes into the atmosphere, land, rivers, and groundwater that eventually pollute the soil and as such, it impacts on soil quality. Altogether, industrial and mining activities degrade the soil's physical, chemical, and biological properties.

How can soil revitalization help sustainable agriculture?

But if you want to fix the soil that you have destroyed, it will take 15-25 years if you go at it aggressively. If you do it without much interest, it will take 40-50 years before you can get the soil to a certain level. If the soil is in a bad condition for that long that means two to three generations will go through terrible states of life.

Methods of soil revitalization

Some ways of restoring damaged soil include:

Use of organic farming techniques: Organic farming involves the application of natural means in farming, to reduce harm to the environment. Some organic farming techniques that help restore the soil include use of green manure (uprooted or sown crop parts incorporated or left on topsoil), cover crops, crop rotation and organic compost.

Green manure and cover crops: Green manures and cover crops serve as mulch to the soil preventing the soil from wind/water erosion and moisture loss. They also increase the soil organic matter content as they decompose in the soil. Green manure and cover crops that are legumes (plants which produce seeds in pods) have nitrogen fixing ability. The nitrogen fixing bacteria in their root nodules help capture nitrogen from the atmosphere.

Organic compost: Organic compost is a generally cheaper method of fertilizing the soils compared to inorganic fertilizers. Compost is a mixture of decomposed plant parts and animal waste. The key benefit of composting is that it increases soil organic matter content. Organic matter improves the soil fertility, the soil structure and its water holding capacity. It also sequesters carbon in the soil. The use of compost reduces use of chemical fertilizers

Crop rotation: This is a farming practice which involves growing different types of crops in one location sequentially. This practice reduces soil erosion, increases the soil fertility and subsequently crop yield.

Soil remediation: Soil remediation involves the removal of harmful contaminants such as, heavy metals, sewage sludge, coal tar, carcinogenic hydrocarbons, liquors and petroleum from soils. Soil remediation can be achieved using biological techniques like

Phytoremediation: The use of plants to remove contaminants from soils or to degrade contaminants to a lesser toxic form. Some plants have the ability to extract contaminants from soils. This process is called phytoextraction.Some other techniques are phytostabilization, phytotransformation and phytostimulation

Bioaugmentation: This is the introduction of genetically modified micro organisms into contaminated soils with the aim of degrading contaminants. The efficiency of this technique depends

on a number of factors, some of which are the physico-chemical properties of the soil and the ability of the introduced micro organisms to compete successfully with the indigenous soil micro flora.

Land-based treatments: This includes techniques like land farming and composting. In land farming, contaminated soils are taken to land farming sites and continuously overturned and tilled to allow aeration. In composting, micro organisms present in organic material are used to biodegrade soil contaminants

Desalinization: Soil salinization occurs when high levels of soluble salts accumulate in the root zone. Saline soils frustrate crop growth and reduce crop yieldSuitable technologies such as reverse osmosis and electrodialysis to provide desalinated water for agriculture are currently available and can provide water for agriculture, but at a cost that is currently more expensive than that generally used for agricultural purposes. The adaptation of desalination to supply water for agriculture may be cost effective; especially when applied to high value crops where the cost of the water is not a critical issue.

Agro forestry

Agro forestry involves combining tree plantation with another enterprise, such as grazing animals, production of mushrooms, or managing woodlot for diversity of special forest products. Agro forestry system can produce firewood, biomass, feedstocks, pine straw mulch, fodder for grazing animals, and other traditional forestry products.

Many agriculture practices disturb the balance of nature. These result in loss of soil through soil erosion and also cause the reduction of soil fertility. Intensive cultivation without either natural or artificial argumentation of nutrients can only exhaust soil fertility. To overcome this problem nowadays farmers are adapting to agro forestry. Agro forestry is a farming system that integrates crops or livestock with trees and shrubs. The resulting biological interaction provides multiple benefits including diverse field income sources, increased biological production, better water quality, and improved habitat for both human and wildlife. Farmers adopt agro forestry practices for two reasons; i) they want to increase income stability and ii) they want to improve the management of natural resources under their care.

Constructing Dams:

One of the scientific methods to check soil erosion which happens maximum by river floods can be avoided by constructing dams across the rivers. Water speed can be checked and it considerably saves soil from erosion.

Use of Early Maturing Varieties:

Primary budding varieties of crops take really very less time to mature. Thus putting lesser pressure on the soil can help in reducing the soil erosion.

Ploughing the Land in Right Direction:

Ploughing the land in a perpendicular direction to wind direction. This also reduces wind velocity and protects the topsoil from erosion.

Soil Quality Index:

While some of the indicators of soil quality may be sensitive to change, others may be more subtle. The overlying question is whether we can measure and quantify these indicators and develop them into a Soil Quality Index that can be used reliably to monitor and predict the impact of farming systems and management practices on soil productivity, environmental quality, food safety and quality, and human and animal health. Moreover, can these indices provide an early indication of soil degradation and the need for remedial measures, and characterize changes in soil properties that would reflect the extent of rehabilitation or regeneration of degraded soils? The ultimate goal is to develop a mathematical relationship or model that could quantify the various attributes of soil quality, and from it derive one or more indexes for simulation and prediction.

Soil Quality Index = f (SP, P, E, H, ER, BD, FQ, MI)

SP = Soil Properties

P = Potential Productivity

E = Environmental Factors

H = Health (Human/Animal)

ER = Erodibility

BD = Biological Diversity

FQ = Food Quality/Safety

MI = Management Inputs

We would have to determine the interaction of these indicators and the relative weight of each. Much valuable information is already available from research on benchmark soils and long-term tillage and fertility trials. We can also speculate on how soil quality indices might be used, including the following:

- Assess the impact of management practices on soil degradation and soil conservation.
- Assess the accrued benefits on highly erodible lands under the Conservation Reserve
- Program that was authorized by the 1985 Farm Bill.
- Provide a basis for conservation compliance.
- Establish the loan value and price of land.
- Establish a more realistic base for tax assessment and tax credit.
- Assess the impact of management practices on human and animal health.
- Assess the impact of management practices on food safety and quality.

Relationship of Soil Quality to Alternative Agriculture and Sustainable Agriculture

Alternative Agriculture: The Strategy

The National Research Council (1989) defined alternative agriculture as a system of food and fibre production that applies management skills and information to reduce costs, improve efficiency, and maintain production levels through such practices and principles as:

- Crop rotations instead of monocultures
- Integrated crop/livestock systems
- Nitrogen fixing legumes
- Integrated pest management
- Conservation tillage
- Integrated nutrient management
- Recycling of on-farm wastes as soil conditioners and bio fertilizers

A U.S. House of Representatives Report (1988) considered low-input or alternative agricultural practices as promising strategies for preventing groundwater pollution and lowering farmer's production costs. The report implied that these goals could be achieved by reducing, or largely excluding, the use of chemical fertilizers and pesticides.

Sustainable Agriculture: The Goal

Sustainable agriculture is increasingly viewed as a long-term goal that seeks to overcome problems and constraints that confront the economic viability, environmental soundness, and social acceptance of agricultural production systems both in the U.S. and worldwide. Although there are many definitions of sustainable agriculture, most of them encompass the same elements: productivity, profitability, conservation, health, safety, and the environment. The U.S. Congress (1990) in drafting the "Food, Agriculture, Conservation, and Trade Act of

1990"-PL 101-624 (better known as the 1990 Farm Bill) defined sustainable agriculture as an integrated system of plant and animal production practices, having site-specific application, that over the long-run will do the following:

- Satisfy human food and fibre needs
- Enhance environmental quality and the natural resource base
- Make efficient use of non-renewable resources
- Utilize natural biological cycles and controls
- Improve the economic viability of farming systems
- Enhance the quality of life for farmers and society as a whole.

Conclusion

There is a strong consensus that the establishment of a global network for monitoring, assessing, improving, and restoring the quality of degraded soils is a logical and appropriate goal. Research is needed to quantify the indicators or attributes of soil quality into indexes that can accurately and reliably characterize the relative state of soil quality as affected by management practices and environmental stresses. The best indicator of soil quality probably will differ according to agroecological zones, agroclimatic factors, and farming systems. It is likely that soil quality indicators would be quite different for paddy rice compared with crops grown in well-drained soils. Conservation of agriculture improves soil aggregation compared to conventional tillage systems and zerotillage without retention of sufficient crop residues in a wide variety of soils and agro-ecologicalconditions. A high priority for future research is to identify and quantify reliable and meaningful biological/ecological indicators of soil quality, including total species diversity and genetic diversity of beneficial soil microorganisms. We need to know how these indicators are affected by management practices, and how they relate to the productivity, stability and sustainability of farming systems

The needed yield increases, production stability, reduced risks and environmental sustainabilitycan only be achieved through management practices that result in an increased soil quality incombination with improved crop varieties.

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ABOUT THE EDITOR

Dr. Brahmaji Rao Pandu, Ph.D., is an Associate Professor at Acharya Nagarjuna University and the Head of the Departments of Environmental Sciences and Education. He published more than 146 articles in international and national journals and published five books on ecology and biodiversity. He is a senior faculty member in the environmental sciences department with 22 years of teaching and research experience. He guides doctoral students in conducting research in various areas of ecological studies: mangrove ecology, biodiversity conservation, water quality and pollution aspects, environmental toxicology, environmental impact assessment, and health. Under his supervision, 17 Doctorates and 5 M.Phil. degrees were awarded. He delivered more than 300 key note lectures as a resource person for national and international seminars, workshops, and awareness programmes. He has received the Best Research Paper Award for the International Conference on Environmental Science and Technology, organised by the American Academy of Sciences in Houston, Texas.

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PREFACE

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In the contemporary period, biology has made great advances that have influenced all major branches of human knowledge. The solutions to major problems, like health and shelter, are expected from the pursuit of biological sciences. The student of biology can acquire a perceptive of all facts of the subject by a proper understanding of the structural and functional organization of plants, animals and man. While learning historical developments and modern trends, the students must be aware of the application and significance of this biological background in daily living. It will help to enter various academic and professional pursuits or to enter life with great satisfaction as regards this knowledge of living surroundings, processes and phenomena.

Biology is one of the most exciting disciplines of science and the thrill of its discoveries should reach the common man. Advances in Biology hold a lot of promise for improvement of the human life; hence we believe that the excitement of this field should be transmitted to the students.

The present book has been developed to meet the above needs. We are grateful to all the contributors for writing informative and authoritative and informative articles for this volume. The publication of the present work could not have been possible without the sincere cooperation and hard work of contributors. We have tried to honour their ideas in the original shape. While dealing with such voluminous work, errors are likely to occur despite our best efforts. However, the onus of technical content rests with contributors.

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RECENT ADVANCES IN BIOLOGICAL SCIENCES, Volume 1

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PHYTOCHEMICAL SCREENING AND QUANTITATIVE ESTIMATION OF METALS IN NUT GRASS USING FLAME PHOTOMETRY

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ABSTRACT

Plants are the rich source of medicine because of the presence of large amount of phytochemicals and the phytomedicines which act symbiotically. In addition plants are act a rich source of minerals which have a profound effect for the continuity of life by supporting the phytomedicines in feedback manner. Sodium (Na) and potassium (K) are the two important metals that plays vital role in the human body. Preliminary phytochemical screening of Acetone Hydro alcohol aqueous extracts of nut grass powered plant material reveals in the presence of alcoholised, terpenoids and steroids in it.Quantitative determination of Sodium and Potassium in these extracts using Flame Photometry reveals the presence of 12.56 ppm, 5.67 ppm and 3.32 ppm of Na in acetone, aqueous alcoholic and in water extracts respectively, whereas 8.46 ppm, 13.45 ppm and 5.12 ppm of K present in acetone, aqueous alcoholic and in water extracts respectively.
Key words: Nut Grass, Phytochemical screening, Flame photometry.

1. PLANT INTRODUCTION

NUTGRASS (Fig. 1) although not a grass species, the name 'nutgrass' was commonly used for this plant in Australia. It is also sometimes called nut sedge[1] or purple nutsedge,[2] red nut sedge, Khmer kravanhchruk[3] is a species of sedge (Cyperaceae) native to Africa, southern and central Europe (north to France and Austria), and southern Asia. The word cyperus derives from the Greek κύπερος, kyperos,[4].

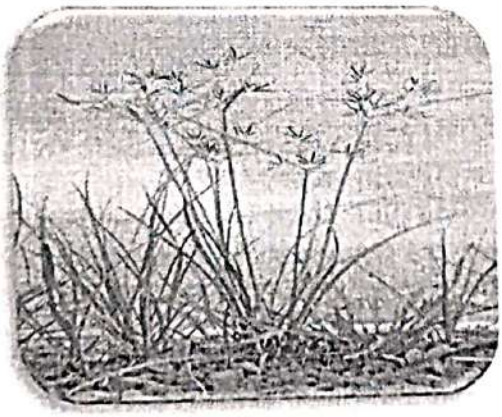

Fig. 1 Nut grass plant

Literature survey reveals that it has antimicrobial activity as well as determined the possible bioactive components of *Cyperusrotundus* rhizomes using GC-MS analysis, These results have

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shown that the plant has a significant biological effect, which can be used as an antimicrobial drug against bacteria and fungi. [5].The antibacterial activity test was done by measuring the diameter of the inhibition zones using the diffusion agar method [6]. It is multipurpose plant, widely used in traditional medicine around the world to treat various diseases such as analgesic, alternative, astringent, antispasmodic, antibacterial, carminative, contraceptive, demulcent, emmenagogue, emollient, febrifuge, immunostimulant, laxative, tonic, vermifuge. indigestion, constipation, dysentery, abdominal distention, neurogenic gastralgia, chest pains, irregular menstruation, painful menstruation, skin diseases, furuncle infections, leprosy, sprains and bruises, and fever[7-9]. Methanolic extract of C. rotundus showed significant anti-helmintic activity [10]. The observed antioxidant activity in the various parts of the grass may be due to their rich pool of phytochemicals[11]. Aqueous extracts and leachates of leaves and tubers of *Cyperusrotundus* L. exhibited inhibitory effects against fetal growth of rats during pregnancy[12]. The ethanolic extract showed highest anti-bacterial activity[13], anti-hyperglycemic effect[14], anti-ulcer activity [15].

As we all know that, Plants are the rich source of medicine because of the presence of large amount of phytochemicals and the phytomedicines which act symbiotically. In addition plants act as rich source of minerals which have a profound effect for the continuity of life by supporting the phytomedicines in feedback manner.Sodium is the major extracellular cation and it plays a major role in body fluid distribution whereas potassium is essential for normal cell function. Potassium is an essential mineral that is needed by all tissues in the body. Potassium is found naturally in many foods and as a supplement. Its main role in the body is to help maintain normal levels of fluid inside our cells.

In this present study Acetone, hydro alcoholic and aqueous extracts of Nut Grass were subjected to preliminary phytochemical screening analysis and further these extracts were studies for the estimation of sodium and potassium using Flame photometry.

MATERIALS AND METHODS

2.1 Collection of plant materials:

The nut grass was purchased in local market Vijayawada. The collected plant materials was dried in shady conditions, the dried materialswas powered, the powdered plant material is then stored in the suitable conditions (air tight, light resistant containers).

2.2 Chemicals and reagents:

All the chemicals used were of analytical grade and were purchased from Merk chemicals private limited, Mumbai.

2.3 Instruments used: Soxhlet apparatus is used for the extraction of phyto-constituents from the plant powder. Flamephotometry.

2.4 Methods

2.4.1 Extraction procedure:

The powdered material Nut Grass of 20 mg was weighed and is subjected to soxhlet extraction using solvents acetone, hydro alcohol and water in successive modes for 48 h. The solvent was then recovered using Rotary Vacuum Evaporator. Concentrated extract was further evaporated to get dry powder. The dried powder was preserved in an airtight bottle. The crude extracts thus obtained were used for further investigation of phytochemical screening.

2. Experimental

2.1 Preliminary phytochemical screening

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The extracts of the powdered leaves of nut grass seeds analyses for the presence of various phyto-constituents like steroids, Tri-terpenoids, saponins, alkaloids, carbohydrates, flavonoids, glycosides and phenolic compounds were identified using standard phytochemical procedures as described below.

3.2 Analysis of Sodium and Potassium by Flame Photometric method:

Preparation of Sample extract for analysis:

For preparation of sample extract, 10 mg of the extractwasseparately mixed with 10 ml of water. The extract was completely exhausted by adding small quantities of water and filter off every time in a successive manner, to yield final volume of 1 liter.

Preparation of Standard sodium and potassium Solutions:

1000 ppm of standard solution was prepared by dissolving 2.5416 gms of NaClor 1.9070 gms of KCL in 1 litre of glass distilled water.

A series of 10, 20, 30, 40, 50, 60, 70, 80, 90 and 100 ppm solutions were prepared by diluting 1ml, 2ml, 3ml, 4ml, 5ml, 6ml, 7ml, 8ml, 9ml and 10ml of the above standard solutions to 100ml. Sodium and potassium are analysed at a wave lengths of 589 nm and 768 nm respectively.

A calibration graph was drawn with these standard solutions and using this calibration curve concentration of Na and K in the extracts was determined[16].

RESULTS AND DISCUSSION

4.1 Phytochemical screening:

The Acetone and hydro alcoholic extracts of Cyperusrotundus showed the presence of alkaloids and steroids. While, provided the absence of terpenoids, saponins, glycosides, tannins, quinones, carbohydrates. Flavonoids and resins were shown in Table 1. The aqueous extract of *Cyperusrotundus* showed the presence of alkaloids, terpenoids, and steroids. While, provided the absence of saponins, glycosides, tannins andquinones.

Table 1: Results of phytochemical screening of the Acetone, hydro alcoholic and aqueous extract of Nut Grass

S.NO	SECONDARY METABOLITES	ACETONE	ETHANOL+ WATER	WATER
1	Alkaloides(Wagnere's test)	+Ve	+Ve	+Ve
2	Terpenoids(foam test)	-Ve	-Ve	+Ve
3	Saponins(legal test)	-Ve	-Ve	-Ve
4	Glycosides (legal test)	-Ve	-Ve	-Ve
5	Tannins (general colour test)	-Ve	-Ve	-Ve
6	Quinone (rhodamine test)	-Ve	-Ve	-Ve
7	Phenols (ferric chloride test)	-Ve	-Ve	-Ve
8	Carbohydrates (fehlings test)	-Ve	-Ve	-Ve
9	Flavonoids(ferric chloride test)	-Ve	-Ve	-Ve
10	Resins (libermann test)	-Ve	-Ve	-Ve
11	Steroids(Salkowski)	+Ve	+Ve	+Ve

4.2 Metal Analysis by Flame Photometry:

The concentration of sodium (Na) in various plant extracts follows the order - Acetone › hydro alcoholic › Aqueous as shown inTable 2. The highest concentration of Na was being found present in acetone extract and least in aqueous extract. The quantitative estimation of potassium in the plant extracts shows that highest concentration is present in hydro alcoholic extract and the acetone extract has more potassium content than aqueous extract, but less than the hydro alcoholic extract. The proper

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level of potassium is essential for normal cell function. An abnormal increase of potassium (hyperkalemia) or decrease of potassium (hypokalemia) can profoundly affect the nervous system and heart, and when extreme, can be fatal. The normal blood potassium level is 3.5- 5.0 millimole/liter (mmol/l). The K ion concentration was found to 98-180 ppm permissible within the range set up by WHO[17-18]. The concentration of sodium ion with the concerned plant was found in the range (120-340 ppm). Sodium is important in maintaining human body fluid volume and maintaining electric potential in the animal tissue.

Table. 2: Concentration of Na and K found in Nut Grass by Flame photometry

Extract	Na ppm	K ppm
Acetone	12.56	8.46
Hydroalcoholic	5.67	13.45
Aqueous	3.32	5.12

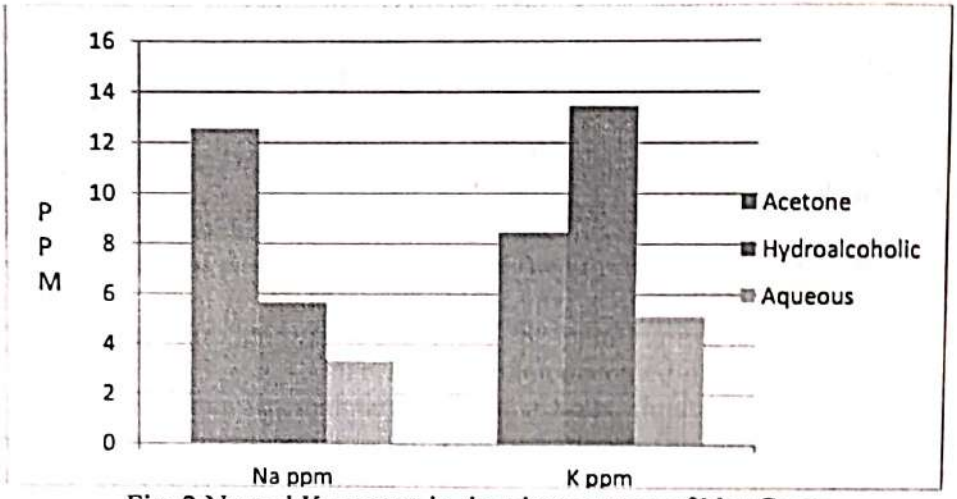

Fig. 2 Na and K content in the plant extract of Nut Grass

CONCLUSION

Hence, the phytochemical screening of the selected plant sample was done. From the study, it could be concluded that plants are a great source of phytochemicals that could be utilized in curing various ailments. The result of this study shows the presence of some phytochemicals such as alkaloid, steroids and terpenoids in the acetone, hydroalcoholic and aqueous extracts of nut grass. This study helped to know the cytotoxic effect of the phytoconstituents present in plant extracts on the living cells. The study provides an important basis for further investigation into the isolation and characterization of phytoconstituents from the selected plants for the development of drugs. The study was only based on qualitative analysis and screening. It would be better if a quantitative detection, their bioactivity, and IR spectra of the various phytochemicals could be performed. The study would be more beneficial if the detection, analysis, and separation of the phytoconstituents could be done.

The results obtained are quite interesting for the concerned plant. The metals analysed in all the three parts are within the range set up by the WHO. The metals in their limit are useful for the living beings, their increase or decrease from the limiting value could cause a defect. The metal ions are very essential for all type of metabolic chains like respiration, reproduction, absorption of nutrientsetc, so their deficiency or over accumulation is seen with a direct effect. As per this plant is taken into consideration, it is mineral rich so should be consumed with a good amount.

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About The College:

Kakaraparti Bhavanarayana College is a vivacious outcome of a century old renowned charitable organization, S.K.P.V.V. Hindu High Schools committee with "Tejaswina Vadheethamasthu" as its motto. Since its inception in 1965, it marked an epoch in innovative education, in an academically and economically impoverished area. The college with heightened social imagination and ardent zeal, shone like a lodestar led innumerable students towards the goal of an illustrious life. The ever vibrant college grew by leaps and bounds and has evolved with times. It has been adorned with the Autonomous status by the UGC in the year 2010, and received "Best Laboratory", "Best Academic Achievement", "Best Library", "Best NSS Unit" awards. The College has never rested on its laurels and has been relentlessly raising the bar. It is certified with ISO 9001-2015 which has been given for Quality Management Standard and accorded with CPE in 2016 by UGC. It has been reaccredited with "A" Grade by NAAC in 2019.

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RECENT ADVANCES IN BIOLOGICAL SCIENCES, Volume 1

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Study on Zooplankton Diversity and Density in Fish Ponds at Penamaluru and ThotlaValluru Regions of Krishna District, Andhra Pradesh, India

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AG & SG Siddhartha Degree College of Arts and Science, Vuyyuru, Andhra Pradesh, India

Abstract

A large number of organisms depend on the Zooplankton which constitutes an important component of freshwater pond biodiversity. The optimum fish production is totally dependent on water quality parameters and plankton population. Species composition of the plankton community is an efficient indicator of water quality. The present study deals with Zooplankton diversity and density for a period of six months from March 2021 to August 2021 in fish ponds of Penamaluru and Thotla Valluru regions of Krishna District, Andhra Pradesh. Intensive culture is practiced at Penamaluru fish ponds and extensive fish culture is practiced in Thotla Valluru fish ponds. Zooplankton diversity was studied in both these systems and the result revealed that the zooplankton was represented mainly by 4 groups' viz., Rotifera, Cladocera, Copepod and Ostracoda. 15 different species were observed and recorded. They are 7 Rotifers, 3 Cladocerans, 3Copepods and 2 ostracods. Of these Rotifers was the dominant group of zooplankton with respect to diversity and population density. Present study revealed the following percentage composition of zooplankton in both types of ponds. It is almost similar with a range of 40 - 42 % rotifers, 29- 34 % cladocerans, 20-16 %, copepods and 12 -10 % ostracods respectively in Penamaluru and Thotla valluru fish ponds.

Keywords: Zooplankton, Fish Ponds, Penamaluru, Thotla valluru, Rotifera, Cladocera, Copepoda, ostracoda.

Introduction

Zooplankton serves as indicators of water quality and plays an important role in fish culture. They constitute the most import link in the energy transfer between phytoplankton and higher aquatic fauna, and contribute significantly to secondary production in fresh water ecosystem (Sharma, 1998). It plays an important role in recycling nutrients as well as cycling energy within their respective environment. These are the main sources of natural food for fish which is directly related to their survival and growth (Miah *et.al.*, 2013). They are the essential food item for fish larvae culture (Alam *et.al.*, 1987). The planktonic study is a very useful tool for the assessment of water quality in any type of water body and also contributes to an understanding of the basic nature and general economy of the water body.

The number and species of plankton serves to determine the quality of water body (Wetzel, 1975). The density and diversity of zooplankton are influenced by physico-chemical parameters of water (Saba and Sadhu, 2015). The fish ponds with extensive culture are getting polluted due to domestic waste, sewage, industrial, aquatic and agricultural effluents where as in intensive fish farming water quality and plankton diversity is maintained. This has a great influence on fish growth and yield. Planktons also prevent the development of macrophytes that are undesirable for fish. Hence the main objective is to maximize the plankton production in fish ponds for optimum yield and economic benefits. However, information on relation between Zooplankton diversity and fish yield fauna is very limited (Ahmad and Siddiqui, 1995, Choudhary and Singh, 1999).

Rotifers, cladocerans, copepods and ostracods constitute the major groups of zooplankton (Kar and Kar, 2016).So in the present investigation an attempt is made to study the zooplankton species richness and diversity in two different ponds of Krishna District. The literature on Zooplankton diversity in Andhra Pradesh is scarce except a few reports from Lake Kolleru region. Present study was carried out keeping in view of above information and scarcity of literature from Andhra Pradesh

Materials and Methods

Study Area

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Fish ponds at penamaluru are located at a distance of 21 Kms fromVuyyuru. The latitude of the ponds is 16.4698 °N and longitude is 80.7257 °E. Ponds are provided with water from an overhead tank with the help of motor. In these ponds pungas, carp and rohu fishes are cultured. Thotla valluru fish ponds are located at a distance of 15km. from Vuyyuru. The latitude of the ponds is 16.3716°N and longitude is. 80.7699°E. The ponds are rain fed and are used for carp and rohu fish culture.

Zooplankton sample collection and preservation:

Zooplankton samples were collected by two methods.

1. By filtering 20-25 liters of water through plankton net made of 0.25mm mesh size. The surface water for this purpose is collected with the help of plastic bucket.
2. Zooplankton is also collected by lowering the net into the surface and subsurface layers of water and moving it horizontally and slowly in upward direction.

The plankton is collected in the small bottle tied to the end of plankton net and is fixed in sterilized vials with 5% formalin. The plankton is collected weekly once usually between 8am and 10 am.

Zooplankton species identification was done following standard literature of Battish (1992); Edmondson (1959); Michael and Sharma (1998); Sharma (1998); Sharma and Sharma (2008, Alfred *et al.*, 1973). The quantitative analysis of planktonic organisms was carried out using Sedgwick Rafter plankton counting cell in according to Welch (1948). For studying the diversity of Zooplankton samples were taken in a Sedgwick-Rafter counting chamber and observed under a light microscope under prerequisite magnification (10 X initially than followed by 40 X) and the specimens were identified following standard literature.

Results

Present study revealed 15 species of Zooplankton in both the fish ponds belonging to the four groups namely Rotifera, Cladocera, Copepoda and Ostracoda. Among all four groups maximum abundance of rotifers (42%) is observed (Table). Seven species of rotifers, three species of cladocerans, three species of copepods and two species of ostracods were observed.

Zooplankton observed and recorded:

1. **Rotifers**-.Brachionus caudatus, B.quandridentatus, B.forficula, B.falcatus, Keratella sp, Asplanchna sps, Filinia longiseta
2. **Cladocerans**- Moina sp, Daphnia sp, Ceriodaphnia sp.etc.
3. **Ostracoda**- Cypris, Stenocypris
4. **Copepods**-Mesocyclpos sps, Microcyclops sps and *Heliodiaptomus sps.*

Monthly distribution of available Zooplankton density in Penamaluru fish pond:

MONTHS	ROTIFERA	CLADOCERA	COPEPODA	OSTRACODA	TOTAL
March2021	7	7	4	3	21
April 2021	7	6	3	3	19
May 2021	6	5	2	2	15
June 2021	9	6	6	2	23
July 2021	12	7	6	3	28

August 2021	13	8	6	3	30
Total	54	39	27	16	136
Percentage	39.7=40%	28.6= 29%	19.8=20%	11.7=12%	

Monthly distribution of available Zooplankton density in Thotlavalluru fish pond:

MONTHS	ROTIFERA	CLADOCERA	COPEPODA	OSTRACODA	TOTAL
March2021	7	7	4	3	21
April 2021	7	5	3	2	17
May 2021	6	4	2	2	14
June 2021	9	6	2	2	19
July 2021	9	7	3	1	20
August 2021	8	7	3	1	19
Total	46	36	17	11	110
Percentage	41.8=42%	32.7= 33%	15.45=16%	10%	

The results show that there is a slight decrease in plankton density in the month of May, due to high temperatures. As temperature level increases the dissolved oxygen concentration in water also decreases due to the inverse relationship between the two. When dissolved oxygen decreases the density of Zooplankton decreases which is clearly observed in fish ponds. The plankton densities in Penamaluru fish ponds increased slowly or remained constant in the months of July and August due to intensive farming as water quality parameters are maintained. The Plankton density in Thotla valluru fish pond decreased slowly as the physico- chemical parameters of water are not maintained due to extensive fish farming.

Rotifers respond very quickly to environmental changes than other planktonic species. Hence rotifers were dominant both in intensive and extensive culture. Water temperature and availability of food to organisms actually affect the copepod population according to Choubey (1997). High and static density of copepods is observed during July and August in both types of ponds. Cladocerans are mostly observed during the sixth months of study which may be due to favourable temperature and availability of food, nanoplankton, and suspended detritus. The Physico chemical factors like DO, water temperature and turbidity also play crucial role in diversity and density of cladocerans.

Conclusion

The objective of this investigation was to know the zooplankton diversity in a fresh water fish ponds and its effect on fish growth and yield. To develop our knowledge about the biodiversity of fish ponds, endowed with different fauna, especially the zooplankton as they are playing a vital role in the stability and integrity of aquatic ecosystem. The present preliminary study conducted revealed diversity of zooplankton in fish ponds and that Rotifera constitute higher

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species abundance. From the studies it is noted that a large number of diverse zooplanktonic forms with rich biodiversity is supporting the pond ecosystem. Further, detailed investigation through regular monthly sampling with more quantitative and qualitative analysis is needed to confirm the exact status of water body which would help to conserve the zooplankton diversity and water quality.

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