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India Trade with European Union

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Abstract
In this research paper an attempt is made to study the India's trade relations with European Union. The data for India's exports to European Union and imports from European Union to the period twenty years (2000-01 to 2019-20) were compiled. Under the title of European Union, eighty percent countries are developed, therefore it is in the fitness of things that a detailed look should be taken at India's trade with European Union, as India is in a great need of increasing its exports to European Union.
Key words: Trade, Export, Import, European Union

Introduction

Profile of European Union (EU)

France, Germany, Italy, Belgium, Luxembourg, and the Netherlands established the European Economic Community (EEC) or European Community (EC) in 1957 under the Treaty of Rome. Ireland, Denmark, and the United Kingdom joined the original six members on January 1, 1973, bringing the total number of members to ten. In 1981, Greece joined, and Portugal and Spain joined in 1984. Now there are 27 members in the community. The European Union has been its name since 1993. (EU).

Objectives of the Study

To study the India's Share of Export and Import Position with European Union.
To study the India trade with world.
To study the India trade with European Union.

Research Methodology

The present study is descriptive in nature and is based on secondary data. The data has been extracted from various sources like research articles, publications from Government of India.

1. India's Trade with World, India's Total Export and Import Picture with World

(Rs. in Lakhs)

Sr. No.	Year	Export	SGR	Import	SGR	Deficit
1	2000-01	20,357,101.09	-	23,087,276.03	-	-11.83
2	2001-02	20,901,797.34	2.68	24,519,971.85	6.21	-14.76
3	2002-03	25,513,727.66	22.06	29,720,587.39	21.21	-14.15
4	2003-04	29,336,674.75	14.98	35,910,766.36	20.83	-18.31
5	2004-05	37,533,952.62	27.94	50,106,454.02	39.53	-25.09
6	2005-06	45,641,786.15	21.60	66,040,890.32	31.80	-30.89
7	2006-07	57,177,928.52	25.28	84,050,631.32	27.27	-31.97
8	2007-08	65,586,352.18	14.71	101,231,169.92	20.44	-35.21
9	2008-09	84,075,505.87	28.19	137,443,555.44	35.77	-38.83
10	2009-10	84,553,364.38	0.57	136,373,554.75	-0.78	-38.00
11	2010-11	113,696,426.38	34.47	168,346,695.56	23.45	-32.46
12	2011-12	146,595,939.96	28.94	234,546,324.44	39.32	-37.50
13	2012-13	163,431,828.96	11.48	266,916,195.68	13.80	-38.77
14	2013-14	190,501,108.86	16.56	271,543,390.73	1.73	-29.85
15	2014-15	189,634,841.76	-0.45	273,708,657.82	0.80	-30.72
16	2015-16	171,638,440.44	-9.49	249,030,553.77	-9.02	-31.08
17	2016-17	184,943,355.34	7.75	257,767,536.67	3.51	-28.25
18	2017-18	195,651,452.80	5.79	300,103,343.34	16.42	-34.81
19	2018-19	230,772,619.38	17.95	359,467,461.18	19.78	-35.80
20	2019-20	221,985,418.10	-3.81	336,095,445.60	-6.50	-33.95
	CGR	**14.94**		**16.41**		

Source: https://tradestat.commerce.gov.in

The above table illustrates the detailed information of India's total trading (export and import) development. In the year of 2018-2019 the India's highest total exports

remarks as 230772619.38 lakhs rupees by means of 17.95 percent growth rate and India's smallest total exports is exposed as 20357101.09lakhs rupees in the year of 2000-01. So far as export is concerned the highest simple growth rate of India's total export is recorded in the year of 2010-11 that is 34.47 percent and lowest growth rate is recorded in the year of 2015-16 that is -9.49. The compound growth rate of export is marked as 14.94 and average is pointed out as 113976481.13 which are lower than the average of import. On the other hand the India's highest total import is marked as 359467461.18 lakhs rupees in the year of 2018-19 by means of 19.78 percent simple growth rate with -35.80 percent trading balance and the minimum import is marked as 23087276.03 lakhs rupees in the year of 2000-01. The highest simple growth rate of imports is noticeable as 39.53 percent in the year of 2004-05 and the highest trading deficit of India's total trading is shown in the year of 2008-09 that is -38.83 percent. The compound growth rate of import is marked as 16.41 and average is pointed out as 170300523.11 which are higher than the average of export. The India trade with World has a CGR of 14.94 for exports and 16.41 for imports. It is observed from the above table that the compound growth rate of import is higher and the compound growth rate of export is lower. But the average of the import is higher than that of the average of export.

2. India's Trade share with European Union

India's Share of Export and Share of Import Position with European Union

(Rs. in Lakhs)

Sr. No.	Year	India's Total Export	EU Total Export	%Share Export	India's Total Import	EU Total Import	%Share Import
1	2000-01	20,357,101.09	3837318.13	18.85	23,087,276.03	3430033.02	14.86
2	2001-02	20,901,797.34	3815273.37	18.25	24,519,971.85	3856646.83	15.73
3	2002-03	25,513,727.66	4549168.07	17.83	29,720,587.39	4867638.38	16.38
4	2003-04	29,336,674.75	5288997.48	18.03	35,910,766.36	5444295.83	15.16
5	2004-05	37,533,952.62	6555851.62	17.47	50,106,454.02	7071293.29	14.11
6	2005-06	45,641,786.15	8057143.33	17.65	66,040,890.32	9783291.78	14.81
7	2006-07	57,177,928.52	9612173.64	16.81	84,050,631.32	11635885.94	13.84
8	2007-08	65,586,352.18	11218387.47	17.10	101,231,169.92	13478897.48	13.31
9	2008-09	84,075,505.87	14926146.14	17.75	137,443,555.44	16773855.44	12.20
10	2009-10	84,553,364.38	14137405.60	16.72	136,373,554.75	16093725.98	11.80
11	2010-11	113,696,426.38	17680492.38	15.55	168,346,695.56	17834690.32	10.59
12	2011-12	146,595,939.96	21113466.37	14.40	234,546,324.44	23851609.83	10.17
13	2012-13	163,431,828.96	22800822.22	13.95	266,916,195.68	25019533.58	9.37
14	2013-14	190,501,108.86	25443884.86	13.36	271,543,390.73	26529945.94	9.77
15	2014-15	189,634,841.76	24558042.73	12.95	273,708,657.82	27021181.59	9.87
16	2015-16	171,638,440.44	23412111.93	13.64	249,030,553.77	25343264.03	10.18
17	2016-17	184,943,355.34	25987513.29	14.05	257,767,536.67	25969180.51	10.07
18	2017-18	195,651,452.80	28299370.11	14.46	300,103,343.34	27758603.24	9.25
19	2018-19	230,772,619.38	33443902.52	14.49	359,467,461.18	35551908.86	9.89
20	2019-20	221,985,418.10	31865538.18	14.35	336,095,445.60	31878723.41	9.49

Source: https://tradestat.commerce.gov.in

The above table demonstrates the detailed information of India's total trading (export and import) development and the detailed information of the total European Union trading scenario. In the year of 2018-2019 the India's highest total exports remarks as 230772619.38 lakhs rupees and India's smallest total exports is exposed as 20357101.09 lakhs rupees in the year of 2000-01.In the year of 2018-2019 the highest total export of European Union trading remarks as 33443902.52 lakhs rupees and smallest exports of the total European Union trading is exposed as 3815273.37 lakhs rupees in the year of 2001-02. The highest share of export is 18.85 percent whereas the smallest share of export is noticed as 12.95 percent. On the other hand the India's highest total import is marked as 359467461.18 lakhs rupees in the year of

2018-19and the minimum import is marked as 23087276.03 lakhs rupees in the year of 2000-01.The highest total European Union trading import is marked as 35551908.86 lakhs rupees in the year of 2018-19 by and minimum import is marked as 3430033.02 lakhs rupees in the year of 2000-01.The highest share of import is 16.38 percent whereas the smallest share of export is noticed as 9.25 percent. It is observed from the above table that the share of import is higher and the share of export is lower. But the India's total and EU total import is higher than that of the total of export.

Conclusions

Although EU –India trade has achieved a respectable volume of trade, it has a great scope for further improvement. There is a need for EU and India to look into policy, process, procedures and institutional action governing their trade to ensure a voluminous increase. India is an important trade partner for the European Union. The European Union's export to India is higher relative to India's export to the European Union. The ongoing European Union-India FTA (free trade agreement) negotiations have attracted much attention among trade policymakers. In contrast to most of the developing economies, India is regarded as a country with significant supply side capacity. This means that in response to any meaningful trade concessions resulting from a bilateral deal, Indian suppliers can substantially increase their exports to the European Union. In this way, the likely trade diversion in the European Union may result in reduced imports from other developing and least developed countries and increased imports from India. European Union suppliers may replace India's imports from other sources, resulting in trade diversion for India. Consequently, the overall welfare gains for India will depend on the relatively strength of the trade creation and trade diversion impacts.

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Adaptation of Cormack Mccarthy's Novels

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Abstract
Adaptation is a process of recreation and reinterpretation. In the post-modern world, adaptation is observed from the point of the viewer's response. When the work is adapted, the reader becomes a viewer. These viewers get connected with the work of art and then the film. Adaptation is the outcome of the filmmaker's readings and interpretations of the source text. Though, the film adaptation of any literary text works, it is an independent, coherent, and artistic creation that carries its own meaning. This adapted artistic work is different from its source text. Most of the adapted works are different from the original source. There are several features of these novels that were difficult to adapt into a film. It was the result of McCarthy's writing style who writes without the use of quotation marks, sometimes it makes challenging to distinguish between characters' dialogue.
Keywords: Adaptation, Cinematography, Screenplay

Introduction

Cormac McCarthy, one of the renowned contemporary American literature writers, has earned a lot of acclaim in recent years of his carrier. The variety of the subject matter that he uses in his writing makes him a conspicuous explorer of a variety of American literary themes like religious, racial, and social issues as well as the significance of familial relationships and the sense of belonging to a place. However, his themes of writing keep on changing with time. Cormac McCarthy, a well established contemporary American writer was born in Providence, Rhode Island on 20th July 1933. He is the eldest of the six kids of his parents, Charles Joseph McCarthy and Gladys Christina McCarthy. His family name was Charles Joseph McCarthy Jr. but he later changed it to Cormac. His family moved to Knoxville, Tennessee in 1937 where, after graduating from high school, he went to the University of Tennessee. However, he left the university in 1953 to join the U. S. Air force where he dedicated four years.

His distinguished novel, *The Orchard Keeper*, was published in 1965. He was sponsored with literary grants so that he could travel to southern Europe, where he composed his second novel, *Outer Dark* (1968). *Suttree* (1979), like his other early novels, received generally positive reviews but was not a commercial gain. A MacArthur Fellowship helped him to travel to the American Southwest, where he studied and wrote his fifth novel, *Blood Meridian* (1985). Although it initially garnered a lukewarm critical and commercial reception, it is now regarded as his Great American Novel. *All the Pretty Horses* (1992), was his first widespread experience of success, for which he was bestowed upon both the National Book Award and the National Book Critics Circle Award. It was followed by *The Crossing* (1994) and *Cities of the Plain* (1998), completing the Border Trilogy. In 2005, McCarthy came up with *No Country for Old Men*, *The Road*, published in 2006, and the play *The Sunset Limited*, performed in July 2007 at Garage Theatre in Chicago. *The Road* won Pulitzer Prize and the United Kingdom's James Tait Black Memorial Prize for fiction. Most of his works have been adapted into films, for example, *All the Pretty Horses, No Country for Old Men, Child of God, The Sunset Limited,* and *The Road*. The film adaptation of *No Country for Old Men*, directed by Joel and Ethan Coen, won four Academy awards: best picture, best director, best supporting

actor (Javier Bardem), and best adapted screenplay. He has also been awarded with PEN Saul Bellow Lifetime Award in 2009. Today, McCarthy is a writer of ten novels, two plays, and three screenplays and thus has established himself as one of the prominent American writers.

What is Film Adaptation?

A film adaptation is the transfer of a written work, in whole or in part, to a feature film. It is a type of derivative work. A common form of film adaptation is the use of a novel as the basis of a feature film. Other works adapted into films includes non-fiction (including journalism), auto-biography, comic books, scriptures, plays, historical sources, and even other films. From the earliest days of cinema, in nineteenth-century Europe, an adaptation from such diverse resources has been an ever-present practice of film-making. The main reason for this particular phenomenon of adaptation of a great book, or, especially, a bestseller may is purely commercial. Reasons. But a skilled and ambitious filmmaker may see in a poorly received or poorly written novel enough visual potential to make a great film.

Adaptation of other fictional forms such as novels, plays, or short stories is mostly used to write a screenplay as they provide an already created plot. Adaptation provides a story for the plot and material to write a screenplay by changing it the way it is suitable for commercial use. The idea of one's own story gives freedom to go for its conversion into the screenplay. In the case of an adaptation, one is required to acquire the rights from the original author or publisher to do so. The original story can be old and may not be very attractive, but a screenwriter has the liberty to use the concept and devise characters with new looks, locations, and situations to suit the movie's requirements. Historical events can also be adapted for dramatization to suit movie making. Acquisition of legal rights is required for a such dramatization of historical events except when all of the principal characters in this dramatization are deceased. In case, a single book is a source of true historical facts, its adaptation would require the acquisition of legal rights from the author of that book. The strongest and most effective historical movies are those based on contemporary issues, themes, or plot situations placed in a period context, such as examining the contemporary issues of human rights and the morality of war. The contemporary true story can also be a source for the screenplay. An adapted contemporary true story in screenplay means the dramatized account of an actual event as it happens.

Adaptations are understood as a shift from real to fiction that may or may not be true from other points of view. Adaptation is a process of recreation and reinterpretation. In the post-modern world, adaptation is observed from the point of the viewer's response. When the work is adapted, the reader becomes a viewer. These viewers get connected with the work of art and then the film. According to the reader response theory, the reader always remains in the center. Theory gives more importance to the reader, the reader is more important than the text. Adaptation is the outcome of the filmmaker's readings and interpretations of the source text. Though, the film adaptation of any literary text works, it is an independent, coherent, and artistic creation that carries its own meaning. This adapted artistic work is different from its source text. Most of the adapted works are different from the original source. Many films have their roots in literature. George Bluestone, the first scholar of adaptation work said in his book Novel into Film, a filmmaker is not a mere translator but an established author.

All The Pretty Horses

All the Pretty Horses portrays the story of a young man from Texas. Though the novel is touching and beautiful, it adds a little bit of the classic edge of a McCarthy story including a heavy focus on nature, the cosmos, and each of our places in the world. The novel opens with the funeral of John Grady Cole's grandfather and his family's decision to sell the family ranch and move. Grady, the protagonist of the novel runs

away and goes towards the Mexican border with his friend Rawlins. In their travel, they are accompanied by Jimmy Blevins and face an array of troubling adventures.

It was Billy Bob Thornton who tried first to bring the writer's work to the screen in the shape of one of his finest novels, *All the Pretty Horses*. The movie was shot in New Mexico and Texas. Thornton's ambitious film, based on the novel of Cormac McCarthy and enacted by Matt Damon, Penelope Cruz, and Henry Thomas, became a challenge when its producer Harvey Weinstein insisted that Thornton must cut the film from three hours down to lesser than two. But Thornton and Damon thought that the removal of Daniel Lanois' score was destroying the movie. On its release in 2000, Weinstein's cut was highly criticized, as Thornton's original version has never seen the light of day.

No Country For Old Men

The second attempt to adapt McCarthy's novel to the screen was far more successful. *No Country for Old Men* is one of McCarthy's distinguished novels. Originally it was written as a screenplay but it was adapted into a novel in 2005. The story of the novel moves around the Mexico/US border during 1980 and follows a drug deal that became wrong. Llewelyn Moss, Anton Chigurh, and Ed Tom Bell are the major characters who deal with the fallout from the drug deal. The novel narrates the story of Llewelyn Moss (Josh Brolin), a hunter who makes a drug deal that goes wrong in the middle of the desert. Moss runs away with a briefcase of cash, unconsciously bringing Chirgurh into his life. Sheriff Ed Tom Bell prefers to stay one step behind (Tommy Lee Jones), a contemplative lawman who is going to retire, despairing of the violent world he feels has outpaced him. The Coen brothers adapted the novel in Oscar winning film for, best film, best adapted screenplay, best director, and best supporting actor for Javier Bardem chilling turn. The movie deals with substantial themes of good and evil within a genre framework. It argues that pure evil has always existed among us and it is unstoppable. It is iniquitous, it has no emotions and it is difficult to be reasoned with this. Indeed, the film's pessimistic ending is unexpected for many viewers, but the movie has the potential as one of the greatest crime films of this century. The film is often considered on critics' "top ten" best films list and is recognized by various writers and critics as one of the best films of its decade. It was even preferred as the 10th best film of the 21st century in 2016.

Child Of God

Child of God is McCarthy's third novel. The novel moves around the protagonist who is a serial killer, operating in the 1960s in Appalachian, Tennessee. It deals with McCarthy's feveriout themes of violence and isolation. The novel was adapted into a film, directed by and starring James Franco, in 2013. It also starred Scott Haze, Tim Blake Nelson, and more. The movie was released at the 51st New York Film Festival. Franco as Lester Ballad, in the movie who tries to live outside the boundaries of society. He moves into madness and chaos that deepens as the film goes ahead. There are several features of this novel that were difficult to adapt into a film. It was the result of McCarthy's writing style who writes without the use of quotation marks, sometimes it makes challenging to distinguish between characters' dialogue. He also uses poetic-sounding prose.

The Road

The Road is one more of McCarthy's most successful novels that was translated into a well-loved and award-winning film. The film The Road is an adaption of the Pulitzer Prize winning dystopian novel having the same title. The movie portrays the journey of a father (Viggo Mortenson) and his son (Kodi Smit-McPhee), whose names are implied as only Man and Boy, from an apocalyptic world to a warmer climate.

The novel *The Road* was published in 2006 and adopted into a film in 2008, directed by Joe Hillcoat and based on a screenplay by Joe Penhall. It gained praise from critics around the world and cinematographer Javier Aguirresarobe

received a BAFTA for Best Cinematography.

Conclusion

Adaptation is a process of recreation and reinterpretation. In the post-modern world, adaptation is observed from the point of the viewer's response. When the work is adapted, the reader becomes a viewer. These viewers get connected with the work of art and then the film. Adaptation is the outcome of the filmmaker's readings and interpretations of the source text. Though, the film adaptation of any literary text works, it is an independent, coherent, and artistic creation that carries its own meaning. This adapted artistic work is different from its source text. Most of the adapted works are different from the original source. Cormac McCarthy's novels *All the Pretty Horses*, *Country for Old Men, Child of God, and The Road* and their adoption in the movies carved great success of the writer, director, and Stars. There are several features of these novels that were difficult to adapt into a film. It was the result of McCarthy's writing style who writes without the use of quotation marks, sometimes it makes challenging to distinguish between characters' dialogue.

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Literacy Rate in Solapur District- A Geographical Study

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Abstract:
Literacy rate is very important among population components. The distribution of literacy in India appears to be uneven. Literate means a person can read and write. Literacy is seen to affect many factors like birth, death, migration, marriage etc. At the same time, literacy is very important in terms of economic and social development. Because the level of literacy helps to understand more and social development of the population. The present research paper is titled 'Literacy Rate in Solapur District- A geographical Study'. The literacy rate in the district, its importance in economic and social development, It causality has been studied in the said research paper. For that, the data between the decades 2001 to 2011 has been used.
Key words: To study male-female literacy rate, Taluka wise distribution of literacy, rural-urban literacy rate, importance of literacy and changes due to it.

Introduction:

A person who can read and write is called literate. Economic and social development depends on the level of literacy, that is, the population or the region where the literacy rate is higher, the rate of development is also seen to be higher. At the same time, the population there is more involved in secondary, tertiary and quaternary occupations. On the contrary, the population or region where the literacy rate is low, the growth rate is also seen to be low. At the same time, the population there is seen to be engaged in primary occupation. Regions with higher literacy rates tend to have higher standards of living, while regions with lower literacy rates tend to have poorer standards of living. In India between the years 1951 and 1971, children above 5 years of age were included in the literacy rate. But after the year 1981 it was amended to include children above 7 years of age. Literacy rates do not appear to be uniform across India. In 1947, the literacy rate in India was only 12%. Literacy rate was 18.33% in 1951, 28.30% in 1961, 34.45% in 1971, 43.7% in 1981, 52.21% in 1991. It has increased to a total literacy rate of 64.8% as per the 2001 census. Among them, the total literacy rate of rural areas was 58.7% and the total literacy rate of urban areas was 79.9%. According to the year 2011, the total literacy rate of India is 74.04%. Among them, the literacy rate of the total rural area is 67.8%, while the literacy rate of the total urban area is 84.1%. Literacy in Maharashtra was 27.91% in 1951, 35.08% in 1961, 45.77% in 1971, 57.24% in 1981, 64.87% in 1991, 76.88% in 2001. As of 2011, the literacy rate is found to be 82.30%, the districts with the highest literacy rate are Mumbai suburbs (89.9%), Mumbai city (89.2%), Nagpur (88.4%), Akola (88.0%), Amravati (87.4%), while The districts with lowest literacy are Nandurbar (64.4%), Jalana (71.5%), Dhule (72.8%), Gadchiroli (74.4%).

Objectives:

1) To study literacy in rural and urban areas of the study area.
2) To study the male-female literacy ratio in the study area.
3) To study the importance of literacy in economic development of the study area.
4) To study the changes in literacy rate during the decade 2001 to 2011.

Hypotheses:

1) There will be an increase in the level of literacy in the field of study.
2) Where the literacy rate is higher, the rate of economic development will be higher.
3) Literacy in the field of study will change economic development.
4) Literacy rate will increase day by day due to promotion of educational and scientific thinking in the field of study.

Information Source:

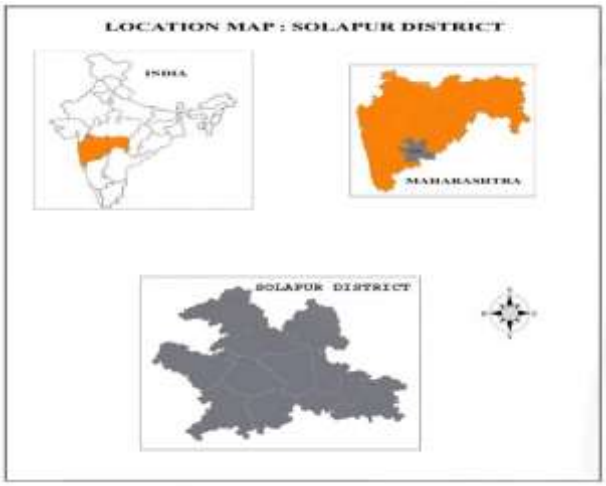
Secondary data has been used for the present research paper. District Social and Economic review - Solapur District, Official Website, Tables have been used to analyze the information

Study of area:

Solapur district is an important district of Maharashtra state. The geographical location of the district is between 17°10′ to 18°32′ North latitude and 74°42′ to 76°15′ East longitude. The total area of the district is 14895 sq. that is about 4.84% of the state is covered by Solapur district. 2.51% (374.49 sq. km) area of the district is urban and 97.48% (14520.91 sq. km) area is rural. The district is bordered by Ahmednagar and Osmanabad districts on the north, Osmanabad district on the east, Sangli district and Karnataka state on the south, and Satara and Pune districts on the west. The district mainly consists of 11 talukas namely Karmala, Barshi, Madha, Mohol, Mangalvedha, Malshiras, Pandharpur, Sangole, Akkalkot, South Solapur and North Solapur. North Solapur is the largest talukas and Karmala in smallest taluka in district.

The literacy rate in Solapur district was 33.90% in 1971, 40.69% in 1981, 56.39% in 1991 and 71.3% in 2001. As per 2011 census, the total literacy of the study area is found to be 77.02%. Among them, total rural literacy is 74.06% and total urban literacy is 83.10%. The total female literacy is 68.55% while the total male literacy is 85.03%.

Location Map: Solapur District.



Formula:

According to the United Nations, the ability to read and write is called literacy. The following formula is used to calculate literacy.

$$\text{Literacy rate} = \frac{\text{Number of literate persons}}{\text{Total population}} \times 100$$

Subject Discussion:

Table No. 1 Taluka wise literacy rate in Solapur district -2001 & 2011 (Rural) (In %)

Year		2001				2011				2001 to 2011		
Sr. No.	Talukes	Females	Males	Total	Gap in female-male literacy rate	Females	Males	Total	Gap in female-male literacy rate	Gap in females	Gap in Males	Gap in Total
1	Karmala	55.4	78.3	67.2	22.9	65.04	82.99	74.37	17.95	9.64	4.69	7.17
2	Madha	57.7	79.4	69.0	21.7	67.97	84.01	76.32	16.04	10.27	4.61	7.32
3	Barshi	58.6	82.2	70.8	23.6	66.35	84.34	75.72	17.99	7.75	2.14	4.92

4	**Solapur North**	57.9	80.1	69.4	22.2	66.59	83.44	75.37	16.85	8.69	3.34	5.97
5	**Mohol**	58.2	80.0	69.5	21.8	66.90	84.00	75.77	17.10	8.7	4	6.27
6	**Pandharpur**	54.0	77.7	66.4	23.7	65.92	83.38	75.03	17.46	11.92	5.68	8.63
7	**Malshiras**	60.6	81.9	71.7	21.3	66.91	83.48	75.48	16.57	6.31	1.58	3.78
8	**Sangole**	51.5	77.5	64.9	26.0	61.50	81.27	71.67	19.77	10	3.77	6.77
9	**Mangalvedhe**	51.6	77.4	65.1	25.8	60.74	80.67	71.09	19.93	9.14	3.27	5.99
10	**Solapur South**	54.2	79.7	67.4	25.5	63.38	82.92	73.42	19.54	9.18	3.22	6.02
11	**Akkalkot**	53.6	79.1	66.7	25.5	57.41	79.33	68.68	21.92	3.81	0.23	1.98
	Total Rural	**56.1**	**79.6**	**68.3**	**23.4**	**64.64**	**82.82**	**74.06**	**18.18**	**8.54**	**3.22**	**5.76**

Source- District Census Handbook, Solapur.2001 & 2011

Above table no. 1 shows the total rural literacy rate of Taluka wise in Solapur district. According to the 2001 census, the total literacy rate in the Taluka wise rural areas of Solapur district was 68.3%.Among them total female literacy rate was 56.1% while male literacy rate was 79.6%. The gap between male and female literacy was 23.4%. According to the census of 2011, the total literacy rate in the rural areas of the district is 74.06%. Among them, the total female literacy rate is 64.64% and the total male literacy rate is 82.82%. The difference between male and female literacy is seen to be 18.18%. Compared to the year 2001, there has been an increase in female literacy in the study area by 8.54%, male literacy by 3.22% and total literacy by 5.76%. It can be seen that the literacy rate in the rural areas of the district has increased in 2011 as compared to 2001.

Table No. 2 Taluka wise literacy rate in Solapur district -2001 & 2011 (Urban) (In %)

Year		**2001**				**2011**				**2001 to 2011**		
Sr. No.	**Talukas**	**Females**	**Males**	**Total**	**Gap in female-male literacy rate**	**Females**	**Males**	**Total**	**Gap in female-male literacy rate**	**Gap in females**	**Gap in Males**	**Gap in Total**
1	**Karmala**	73.9	90.3	82.3	16.4	81.41	92.30	86.96	10.89	7.51	2	4.66
2	**Madha**	75.2	92.1	83.8	16.8	81.69	93.48	87.67	11.79	6.49	1.38	3.87
3	**Barshi**	72.8	89.8	81.5	17.0	79.71	91.64	85.77	11.93	6.91	1.84	4.27
4	**Solapur North**	66.6	86.6	76.8	20.1	75.88	89.62	82.80	13.74	9.28	3.02	6
5	**Mohol**	0	0	0	0	0	0	0	0	0	0	0
6	**Pandharpur**	72.5	88.9	81.0	16.4	81.32	91.78	86.65	10.46	8.82	2.88	5.65
7	**Malshiras**	0	0	0	0	78.11	89.91	84.08	11.80	-	-	-
8	**Sangole**	69.7	86.9	78.5	17.2	77.54	88.17	83.00	10.63	7.84	1.27	4.5
9	**Mangalv**	67.4	87.0	77.	19.6	74.55	88.8	81.	14.27	7.15	1.82	4.29

	edhe			5			2	79				
10	**Solapur South**	0	0	0	0	0	0	0	0	0	0	0
11	**Akkalkot**	53.7	84.3	71.6	25.6	64.30	82.39	73.36	18.09	10.6	-1.91	1.76
	Total Urban	**67.5**	**87.2**	**77.5**	**19.6**	**76.36**	**89.70**	**83.10**	**13.34**	**8.86**	**2.5**	**5.6**

Source - District Census Handbook, Solapur. 2001 & 2011.

Above table no. 2 shows the statistics of literacy rate in total urban areas taluka wise in Solapur district. According to the 2001 census, the total literacy rate in urban areas of Solapur district was 77.5%, out of which the total female literacy rate was 67.5% and the male literacy rate was 87.2%. The gap between male and female literacy was 19.6%. According to the census of 2011, the total literacy rate in the urban areas of the district is 83.10%. Among them, the total female literacy rate is 76.36% and the total male literacy rate is 89.70%. The difference between male and female literacy is found to be 13.34%. Compared to the year 2001, 2011 shows an increase in female literacy rate of 8.86%, male literacy rate by 2.5% and total literacy rate by 5.6%. It is seen that the literacy rate in urban areas of the district has increased in 2011 as compared to 2001. However, there is a decrease in male literacy rate in urban areas in Akkalkot tehsil of the study area.

It can be seen that the literacy rate in rural and urban areas in all the remaining talukas has increased. Increase in per capita income, increase in transport and communication facilities, compulsory free primary education, higher standard of living, higher social status of women, increase in urbanization etc. increase in literacy rate in the study area is seen due to many reasons.

Conclusion:

1) There is an uneven distribution of literacy in the study area.

2) The literacy rate in the study area is higher, there is more economic development. And areas with low literacy rates show less economic development. This shows that literacy is the basic foundation of economic development.

3) Only urban areas of Akkalkot Taluka of the study area show a decline in male literacy rate in 2011 as compared to 2001.

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Professional Commitment And Self-Efficacy Of School Teachers: A study.

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Abstract
Professional commitment is the spirit of a teacher with which he is bound to his profession characterized by professional competencies, professional loyalty, consistency, and conformity to professional standards and ethics. A teacher educator (also called a teacher trainer) is a person who helps other people to acquire the knowledge, competencies and attitudes they require to be effective teachers The teaching profession requires commitment. An effective educator needs to be committed not only to their students, but to their teaching profession as a whole. Professional Commitment Scale for Teachers (By Dr. Ravinder Kaur, Dr. Sarbjit Kaur Ranu, Mrs. Sarvjeet Kaur Brar.) and General Self-efficacy Scale (By Sonali Sud) are used to investigate the relationship between professional commitment and se lf efficacy. The result of the study reveals that there exists positive moderate relationship (±.41 to ±.70= Moderate) of commitment to learner of school teachers with their self-efficacy

Introduction -

The effectiveness of education is very much dependent on the effectiveness of its teachers. A teacher is the single most important factor in the success of a pupil and there by the entire society. Recognizing the importance of teacher, The National Policy on Education (1986) has rightly remarked: "No system of education can rise above the level of its teachers." A teacher is also involved more than simply standing in front of a classroom and lecturing. In fact, though a teacher spends the majority of the day in the classroom, the actual teaching component is only part of the job. An effective teacher understands that teaching involves wearing multiple hats to ensure that the school day runs smoothly and all students receive a quality education. Thus, while having such a course of responsibility, it requires the heart involvement of a teacher to his organization as well as for an effective educational process. It is a teacher's commitment, which is regarded as the determiner of his success in the profession of teaching. The professional commitment of a teacher involves passion an investment of time, a focus on the individual needs of the student, a responsibility to import knowledge, attitudes, values and beliefs, maintaining professional knowledge, engagement with the social community etc.

Till these requirements have the primary need of efficacy and encouragement from within the self. As self-efficacy is involved in psychological processes like cognitive process, motivational process, affective process and selection process etc. which have a great effect on human functioning choices regarding behavior, motivation, thought patterns and responses, health behavior, academic productivity, the destiny idea etc. Thus, as a teacher is in the mission to bring out desired outcomes of students, he should have the idea or judgment of his own capabilities, otherwise it will be very difficult for a teacher to be succeed in his profession.

Statement Of The Problem -

A problem should be started in such a way that it is clear and ambiguous and indicates a relationship between two or more variables.
The problem is started as – Professional Commitment And Self-Efficacy Of School Teachers : A study.

Objectives-

The objectives of the study can be more expletively presented as-
To study the relationship of commitment to the learner of school teachers with their self-efficacy.
To study the relationship of commitment to the society of school teachers with their self-efficacy.
To study the relationship of commitment to the profession of school teachers with their self-efficacy.
To study the relationship of commitment to the achieve excellence of school teachers with their self-efficacy.
To study the relationship of commitment to basic human values of school teachers with their self-efficacy.

Hypothesis-

With a view to investigate the study scientifically, the following hypothesis were formulated by the investigator :

H_{0-1} There exists no significant relationship of commitment to the learner of school teachers with their self-efficacy.

H_{0-2} There exists no significant relationship of commitment to the society of school teachers with their self-efficacy.

H_{0-3} There exists no significant relationship of commitment to the profession of school teachers with their self-efficacy.

H_{0-4} There exists no significant relationship of commitment to the achieve excellence of school teachers with their self-efficacy.

H_{0-5} There exists no significant relationship of commitment to basic human values of school teachers with their self-efficacy.

Delimitation of the study –

The study has following limitations-

1.The study is limitation to the Durg district only.

2.This study is limited to the School teachers only.

3.This study is limited to CBSE board Schools only.

4.This study is limited to Higher Secondary school only.

5.Only two areas of school teacher's professional commitment and self-efficacy have been taken under investigation.

6.It is only a survey research.

7.For the study only Professional Commitment Scale for Teachers (By Dr. Ravinder Kaur, Dr. Sarbjit Kaur Ranu, Mrs. Sarvjeet Kaur Brar.) and General Self-efficacy Scale (By Sonali Sud) are used to investigate the relationship between professional commitment and self efficacy.

Sample –

In the present study, CBSE Boar affiliated 23 Higher Secondary Schools of Durg district were representing the universe. Then 10 Schools were selected by "Random purposive sampling" to represent the population were selected randomly to represent the sample of the study.

SL.No.	Name of the schools	Teacher's
1	B.S.P. Senior Secondary School Bhilai Nagar, Durg-490006	7
2	D.A.V. Public School Hudco,Durg-490009	11
3	Delhi Public School (DPS) Negru Nagar, Durg-490020	12
4	Guru Nanak Eng.Senior Secondary School Sec.06, Bhilai Nager, Durg-490001	7
5	Kendrita Vidyalaya Malviya Nagar Chawk, Durg-491001	9
6	Krishna Public School (KPS) Neheru Nagar, Durg-490020	11
7	Matri Vidya Nikethon, Rishali Nagar, Durg-490006	6
8	Shakuntala Vidyalaya, Ram Nasgar, Durg-490023	8
9	Shri Sankara Vidyalaya, Civic Centre, Durg-490006	9
10	Yogchetna Public School Bhilai Nagar, Durg-490001	6
	Total	86

Tool-

In the present study, the investigator has used two tools -Professional Commitment Scale for Teacher's**(PCST)** (By Ravinder Kaur, Dr.Sarbjit Kaur Ranu, Mrs. Sarvjeet Kaur Brar.) and General Self-efficacy Scale (By Dr. Sonali Sud).

The tool contains total 45 statements where 21 ate positive and 24 are negative statements. 9 questions from each of the under mentioned five areas attributes to the formation of the tool.

A.Commitment to Learner

B.Commitment to the Society

C.Commitment to the Profession

D.Commitment to Achieve Excellence

E.Commitment to Basic Human Values..

Scoring of the tool (PCST):-

Nature of statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Positive	5	4	3	2	1
Negative	1	2	3	4	5

Scoring is done according to the provided scoring key in the manual. The theoretical range of scores from 9 to 45. The high score indicates the higher level of professional commitment.

General Self-Efficacy Scale (GSES-H):-

The scale mainly assesses the strength of an individual's on his or her own ability to respond to novel or difficult situations and to deal with associated obstacles or setbacks. It is a 10 item scale.

Scoring of the Tools (GSES-H):-

Each item has four choices of responses, ranging from "Not at all true" which score 4. The score of each of the 10 items are summed to give a total score. Thus, the range of possible scores for this instrument could very vary from a minimum score of '10' to a maximum score of '40'.

Research Design:-

In the present study "professional commitment" is dependent variable and "self-efficacy" is independent varialble.

Variables	Dependent Variable- Professional commitment. Independent variable- Self-efficacy.
Statistics	Mean (M) Standard Deviation (σ) Correlation (r)
Tool	Professional Commitment Scale For Teacher's By Kaur and Brar. General Self-efficacy Scale By i Sud.

Statistical Analysis

Ho-1 There exists no significant relationship of commitment to learner of school teachers with their self-efficacy.

The 'r' value (0.55) is significant at 0.05 level (df=84, P<0.05). So the above hypothesis is rejected.

(df = 84 r=0.55 P<0.05 Significant)

Ho-2 There exists no significant relationship of commitment to society of school teachers with their self-efficacy.

The 'r' value (0.55) is significant at 0.05 level (df=84, P<0.05). So the above hypothesis is rejected.

(df = 84 r=0.50 P<0.05 Significant)

Ho-3 There exists no significant relationship of commitment to the profession of school teachers with their self-efficacy.

The 'r' value (0.56) is significant at 0.05 level (df=84, P<0.05). So the above hypothesis is rejected.

(df = 84 r=0.56 P<0.05 Significant)

Ho-4 There exists no significant relationship of commitment to achieve excellence of school teachers with their self-efficacy.

The 'r' value (0.32) is significant at 0.05 level (df=84, P<0.05). So the above hypothesis is rejected.

(df = 84 r=0.32 P<0.05 Significant)

Ho-5 There exists no significant relationship of commitment to basic human values of school teachers with their self-efficacy.

The 'r' value (0.42) is significant at 0.05 level (df=84, P<0.05). So the above hypothesis is rejected.

(df = 84 r=0.42 P<0.05 Significant

The present study provides the following conclusions -

1. There exists positive moderate relationship ($\pm$.41 to $\pm$.70= Moderate) of commitment to learner of school teachers with their self-efficacy.

2. There exists positive moderate relationship (±.41 to ±.70 = Moderate) of commitment to society of school teachers with their self-efficacy.
3. There exists positive moderate relationship (±.41 to ±.70 = Moderate) of commitment to professional of school teachers with their self-efficacy.
4. There exists positive moderate relationship (±.21 to ±.40 = low) of commitment to achieve excellence of school teachers with their self-efficacy.
5. There exists positive moderate relationship (±.41 to ±.70 = Moderate) of commitment to basic human values of school teachers with their self-efficacy.

Suggestions –

•The educational institutions should organize refresher courses for teachers to develop their self-efficacy.

•The school administrations should consider teachers not only as employees who work for salary, but they should be regarded as a part and parcel of the administration.

•Educational organizations should arrange some seminars or workshops for the teachers to develop their skills and potentials which help in enhancing their self-efficacy as well as their professional commitment.

•Syllabus designers of educational courses should include some topics based on professional commitment in the courses.

•Some projects should be included in the curriculum so that students also can develop their self-efficacy.

•Educational institution should organize some programs for moral values so that to inspire school teacher to be professionally commitment.

•The society should respect and give importance enough to the teaching profession so that teachers would also respect their profession and can develop their feeling of dedication.

•Teachers should be appreciated for their participation in eradicating social problems.

•Institutions should provide enough facilities to the teachers, so that they can show better commitment towards their profession.

•Teachers should be encouraged to use more advanced technologies in their profession from the part of the Government and institutions.

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Regression Analysis for Dairy Farming in Junagadh district

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Abstract: Dairy farming is one of the fast-moving and profitable businesses in the current scenario. The demand for pure milk has increased since the awareness regarding the benefits of A2 milk. Thus, an attempt was made by the researcher to identify the equation which may predict the volume of milk with the independent variables like the amount of Green fodder and Dry Fodder. The equation formed represents the quantity of milk which can be forecasted among Gir cows. The equation y= 1.867 + 1.016x where x= Quantity of Green Fodder (Kg per day) and y= Quantity of Milk (litres per day) is significant and has an accuracy level of 99.70% whereas, y= 9.064+ 0.343x is not significant and has an accuracy level of only 8.70%. Thus, this research will help the dairy farmers to reschedule their primary activity concerning dairy farming of Gir cows in Junagadh district of Gujarat concerning intake which these cows are fed.

Key Words: Dairy farming, A2 milk, Green and Dry Fodder, significance

Introduction:

Globally Dairy farming is visualised as one of the prominent businesses to have a win-win situation with Nature, Economics and Finance. In the last 30 years, the whole world's milk production capacity has been elevated to approximately more than 59%, from 530 million tonnes in 1988 to 843 million tonnes in 2018. India is visualised as one of the biggest milk production centres contributing 22 per cent of the entire world's production, which was later followed by the countries like USA, China, Pakistan and Brazil and many more. Dairy farming in Africa is growing more slowly than in different developing areas, due to many reasons like poverty and adverse climatic situations. The countries having milk surpluses are New Zealand, the USA, Germany, France, etc. The countries like China, Italy, the Russian Federation, Mexico, Algeria and Indonesia are with deficits in Milk as compared to their demand from growing population. Since the year the 1970s, there is an expansion in the production of milk in South Asia, which is one of the principal drivers for milk production and growth within the developing countries and across the globe and thus, in India too. Dairy farming is one of the most important primary activities in India. As time passed away, India witnessed an increase in demand for Milk which needs to be fulfilled in the right way. As we all are aware of the Dairy farming of indigenous cows like Gir, Sahiwal etc. whose milk is of A2 type and which is the most nutritious, it is our duty to maximise the quantity of milk concerning the feed which we are providing to the cattle in an optimum way. The individuals who are connected with dairy farming need to know the relationship between the quantity of milk produced by their cattle and the amount and type of intake which is given to these cattle(cows). Mathematics is the queen of science which has helped all other fields to establish their results in their respective domain. Precisely forming equations which can be used as a predictor to predict some variable is one of the most important techniques in Mathematical Statistics. Dairy farmers must introspect on what type of feed is been given to the Gir Cows and in how much quantity. The research was carried out in the Junagadh district among different Gir cow sheds. Thus, this research will help the dairy farmers to reschedule their primary activity concerning dairy farming of Gir cows in Junagadh district of Gujarat concerning intake which these cows are fed.

Research Methodology:

2.1 Objectives of Study

To study the relationship between the quantity of milk and the Quantity of Dry fodder given to cattle.

To study the relationship between the quantity of milk and the Quantity of Green fodder given to cattle.

To evaluate the impact of Dry fodder and green fodder consumed on the quantity of milk produced.

2.2 Scope of Study

The Scope of the study was restricted to the Junagadh district and only two independent variables.

2.3 Hypotheses

H0: There is no relation between the quantity of milk and the Quantity of Green fodder consumed.

H1: There is a relation between the quantity of milk and the Quantity of Green fodder consumed.

H0: There is no relation between the quantity of milk and the Quantity of Dry fodder consumed.

H1: There is a relation between the quantity of milk and the Quantity of Dry fodder consumed.

2.4 Research Design

The research design deployed by the researcher was Descriptive as the data collection analysis was done to prove the hypotheses.

2.5 Method of Data Collection

The Data Collected was primary from the owners of the Cow sheds in the Junagadh district. Certain information and data collected were in secondary form also from journals, magazines, newspapers, the Internet etc.

2.6 Mathematical and Statistical Tools and Techniques

The tool for data Collection was the unstructured questionnaire on a ratio scale. The statistical techniques used were correlation and Regression.

2.7 Limitation of Study

1) The sample size was limited.

2) The research was restricted to the Junagadh district.

3) Only limited independent variables were considered.

4) Time and Cost were the relative limitations.

Data Analysis:

The data Regarding Quantity of Milk(Litres/day), Quantity of Dry Fodder (Kg/Day) and Quantity of Green Fodder (Kg/Day) was collected from the cow sheds in Junagadh district.

Table: 1

Sr. No.	Quantity of Green Fodder (Kg/Day)	Quantity of Dry Fodder (Kg/Day)	Quantity of Milk (Litres/day)
1	8	6	10
2	10	7	12
3	9	8	11
4	7	9	9
5	6	10	8
6	11	11	13
7	14	12	16
8	15	13	17
9	12	14	14
10	13	15	15
11	15	6	17
12	12	7	14
13	10	8	12
14	7	9	9
15	6	10	8
16	9	11	11
17	8	12	10
18	11	13	13
19	14	14	16
20	15	6	17
21	10	7	12
22	9	8	11
23	6	9	8
24	8	10	10
25	15	11	17
26	13	12	15
27	14	13	16
28	7	14	9
29	11	15	13
30	8	6	10

Source: Survey

Test of Normality

H0: The data follows Normal Distribution
H1: The data do not follow Normal Distribution

Table 1A

Variable	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	df	Sig	Statistics	df	Sig
Quantity of Milk	.117	30	.200	.964	30	.827
Quantity of Dry Fodder (Kg. per day)	.166	30	.200	.969	30	.882
Quantity of Green Fodder (Kg. per day)	.151	30	.200	.965	30	.837

Source: MYSTAT

From the above table, p values > 0.05
Thus, We Reject H1
Therefore, the data follows Normal Distribution

Test of Homogeneity

H0: Variance of the data are the same for all the groups.
H1: Variance of the data are different for all the groups.

Table 1B

Test for Homogeneity		
	Test Statistic	p-value
Levene's Test	1.292	0.130

Source: MYSTAT

Table 1C

Test for Homogeneity		
	Test Statistic	p-value
Levene's Test	1.126	0.390

Source: MYSTAT

Table 1D

Test for Homogeneity		
	Test Statistic	p-value
Levene's Test	0.972	0.101

Source: MYSTAT

From Tables 1B, 1C, 1D p value are > 0.05 thus, the H1 is rejected, hence Variance of the data are same for all the groups.

To satisfy the first objective, the researcher has made an attempt to frame hypothesis and prove the same using significance of correlation.

To satisfy the first objective, the researcher has attempted to frame the hypothesis and prove the same using significance of correlation.

H0: There is no relation between the quantity of milk and the Quantity of Green fodder consumed.

H1: There is a relation between the quantity of milk and the Quantity of Green fodder consumed.

Table: 2 Correlation

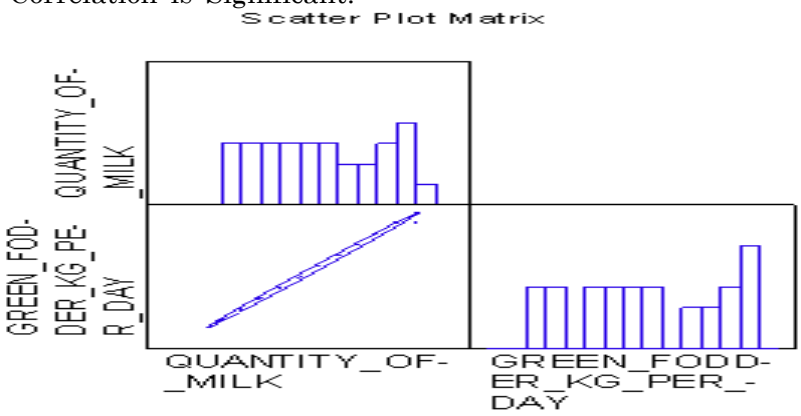
Pearson Correlation Matrix		
	QUANTITY OF MILK	GREEN FODDER KG PER DAY
QUANTITY OF MILK	1.000	
GREEN FODDER KG PER DAY	0.998	1.000

Source: MYSTAT

Sample Size : 30
Sample Correlation Coefficient : 0.998
95.00% Confidence Interval : 0.997 to 0.999

t : 94.596
p-value : 0.000

Interpretation and Results: From the above analysis the researcher found that the p-value is 0.000 which is less than 0.05. thus, we reject H0 and Correlation is Significant. Therefore, there is a relation between the quantity of milk and the Quantity of Green fodder consumed.



To satisfy the second objective, the researcher has made an attempt to frame hypothesis and prove the same using significance of correlation.

H0: There is no relation between quantity of milk and Quantity of Dry fodder consumed.
H1: There is a relation between quantity of milk and Quantity of Dry fodder consumed.

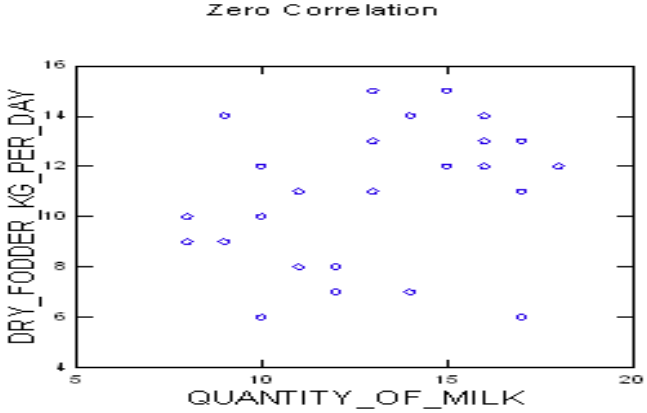
Table: 3

Pearson Correlation Matrix		
	QUANTITY OF MILK	**DRY FODDER KG PER DAY**
QUANTITY OF MILK	1.000	
DRY FODDER KG PER DAY	0.220	1.000

Source: MYSTAT

Sample Size : 30
Sample Correlation Coefficient : 0.220
95.00% Confidence Interval : -0.152 to 0.538
t : 1.194
p-value : 0.242

Interpretation and Results: From the above analysis the researcher found that p value is 0.242 which is more than 0.05. thus, we reject H1 and Correlation is not Significant. Therefore, there is no relation between quantity of milk and Quantity of dry fodder consumed.



To Study the third objective i.e. To study the impact of Green Fodder on Quantity of Milk the researcher had used Simple Regression

Let Y= Quantity of Milk (litres per day)
X= Quantity of Green Fodder (Kg per day)

Table: 4

Dependent Variable	QUANTITY OF MILK
N	30
Multiple R	0.998
Squared Multiple R	0.997
Adjusted Squared Multiple R	0.997
Standard Error of Estimate	0.179

Source: MYSTAT

Table: 5

Regression Coefficients B = $(X'X)^{-1}X'Y$						
Effect	**Coefficient**	**Standard Error**	**Std. Coefficient**	**Tolerance**	**t**	**p-value**
CONSTANT	1.867	0.119	0.000	.	15.680	0.000
GREEN FODDER KG PER DAY	1.016	0.011	0.998	1.000	94.596	0.000

Source: MYSTAT

Table:6

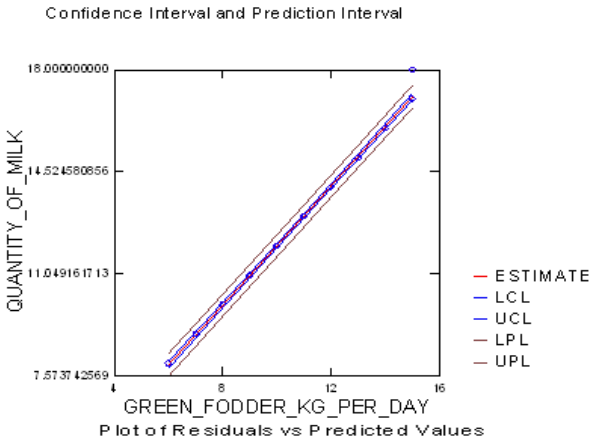
Analysis of Variance					
Source	**SS**	**df**	**Mean Squares**	**F-ratio**	**p-value**
Regression	287.401	1	287.401	8,948.492	0.000
Residual	0.899	28	0.032		

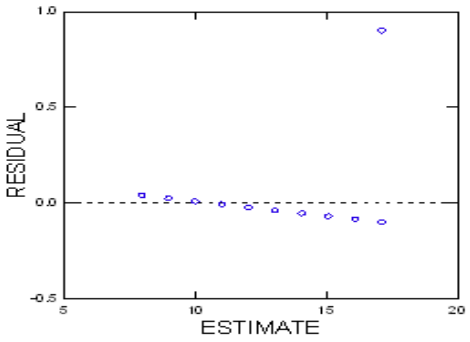
Source: MYSTAT

Table: 7

Durbin-Watson D Statistic	1.510
First Order Autocorrelation	0.025

Source: MYSTAT





Interpretation and Results:

From the above calculations the regression equation is **y= 1.867 + 1.016x** where x= Quantity of Green Fodder (Kg per day) and y= Quantity of Milk (litres per day).

From the table 5, p value for constant and green fodder is less than 0.05 thus they are significant variables. Also, the regression equation is overall significant as from table 6, p value is less than 0.05 and has a accuracy level of 99.70%

Even the value of Durbin Watson value is 1.510 which lies between 1.5 to 2.5 so we can report the result and Autocorrelation is positive.

To Study the impact of Dry Fodder on Quantity of Milk

Table: 8

Dependent Variable	QUANTITY OF MILK
N	30
Multiple R	0.295
Squared Multiple R	0.087
Adjusted Squared Multiple R	0.054
Standard Error of Estimate	9.842

Source: MYSTAT

Table: 9

Regression Coefficients B = $(X'X)^{-1}X'Y$

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	t	p-value
CONSTANT	9.064	2.949	0.000	.	3.073	0.005
DRY FODDER KG PER DAY	0.343	0.210	0.295	1.000	1.632	0.114

Source: MYSTAT

Table: 10

Analysis of Variance

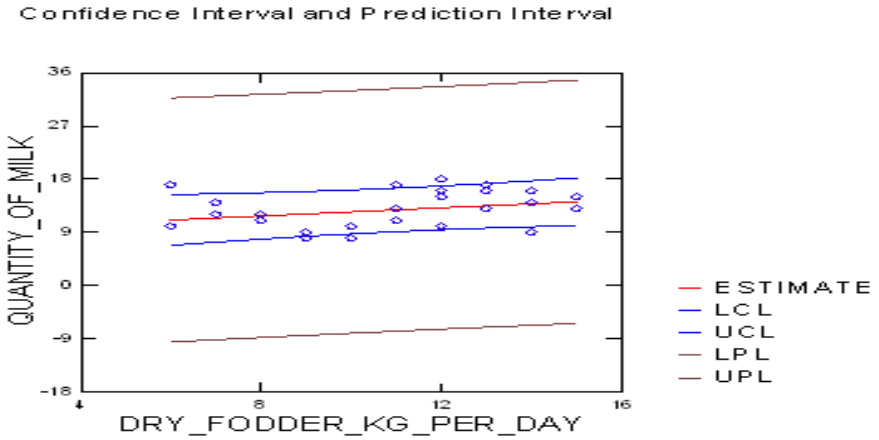
Source	SS	df	Mean Squares	F-ratio	p-value
Regression	258.147	1	258.147	2.665	0.114
Residual	2,712.465	28	96.874		

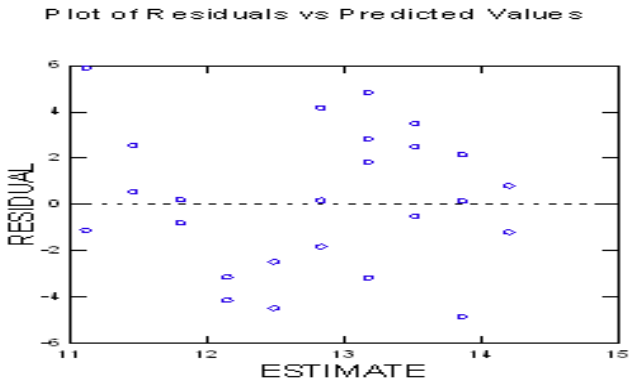
Source: MYSTAT

Table: 11

Durbin-Watson D Statistic	1.041
First Order Autocorrelation	0.335

Source: MYSTAT





Interpretation and Results:

From the above calculations the regression equation is **y= 9.064+ 0.343x** where x= Quantity of Dry Fodder (Kg per day) and y= Quantity of Milk (litres per day).

From the table 9, p value for constant is less than 0.05 thus it is significant whereas p value for Dry fodder is more than 0.05 thus it is not significant variable. Also, the regression equation is overall not significant as from table 10, p value is more than 0.05 and has a accuracy level of only 8.70%.

Even the value of Durbin Watson value is 1.041 which does not lie between 1.5 to 2.5 so we cannot report the result.

To study the multiple regression

Researcher has made an attempt to form Mathematical modelling by taking where x= Quantity of Dry Fodder (Kg per day) and y= Quantity of Milk (litres per day) with the help of Multiple regression.

Sum of X1 = 313, Sum of X2 = 306, Sum of Y = 373, Mean X1 = 10.4333, Mean X2 = 10.2

Mean Y = 12.4333, Sum of squares (SSX1) = 265.3667, Sum of squares (SSX2) = 244.8

Sum of products (SPX1Y) = 265.3667, Sum of products (SPX2Y) = 58.4

Sum of products (SPX1X2) = 58.4

Regression Equation = $\hat{y}$ = b1X1 + b2X2 + a

b1 = 1 b2 = 0 a = 2

$\hat{y}$ = 1X1 + 0X2 + 2

Analysis of Variance

Source	SS	df	Mean Squares	F-ratio	p-value
GREEN_FODDER_KG_PER_DAY	40,923.379	9	4,547.042	7,313.784	0.000
DRY_FODDER_KG_PER_DAY	23.038	1	23.038	37.056	0.000
Error	230.032	370	0.622		

Source: MYSTAT

Conclusion:

The preliminary analyses ensured that there was no interference of the assumptions for normal distribution, linearity, multicollinearity, and homoscedasticity. The regression equation for impact of Quantity of Green Fodder was found to be **y= 1.867 + 1.016x** where x= Quantity of Green Fodder (Kg per day) and y= Quantity of Milk (litres per day). The regression equation was overall significant with the accuracy level of 99.70%. The regression equation for impact of Quantity of Dry Fodder was found to be **y= 9.064+ 0.343x** where x= Quantity of Dry Fodder (Kg per day) and y= Quantity of Milk (litres per day). The regression equation was not overall significant as the accuracy level is 8.70%. The regression equation for impact of Quantity of Green Fodder and Dry fodder on Quantity of Milk was found to be **$\hat{y}$ = 1X1 + 0X2 + 2.** This equation was found to be significant with the accuracy level of 99.97%. Thus, it is concluded that green fodder has greater impact on quantity of Milk produced in Gir cows as compared to Dry fodder. Also, a healthy combination OF Green and Dry fodder should be given to the cattle to have maximum quantity of Milk.

Formation of LPP

	Milking		Availability
	Morning (x)	Evening (y)	
Green Fodder	6kg	9kg	90 kg
Nutritional Fodder	1kg	1kg	30kg
Dry Fodder	3kg	2kg	24kg
Average Fat Content	9	10	
Rate per Fat unit (Rs.)	6	6	
Price Per Litre (Rs.)	54	60	

Source: Shri Krishna Cow Shed, Junagadh

Let x and y be the amount of milk given per day in morning and Evening respectively.

The total Amount Generate will be maximised and will be $54x + 60y$

Thus, we have Max $Z = 54x + 60y$

The Daily consumption of Green fodder is $6x+9y$ and cannot be more than 90Kg, thus we have $10x+8y \leq 200$

The Daily consumption of Dry fodder is $3x+2y$ and cannot be more than 24Kg, thus we have $8x+6y \leq 100$

Similarly, we have $x+y \leq 30$

Since Milk Produced can't be negative

We have $x,y \geq 0$

Proposed LPP model is given by

Max $Z = 54x + 60y$

S.t. $10x+8y \leq 200$

$8x+5y \leq 100$

$x+2y \leq 100$

$x, y \geq 0$

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Mathematical Analysis of Dairy Farming

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Abstract:
Mathematics is the queen of science. The Application areas of Mathematics are of utmost importance. In this research article, the researcher has tried to study the correlational between the dependant variable fat content is the A2 milk of Indigenous cows of Various breeds. The current study highlights the importance of Nutritional food provided to the cows with green and dry fodder. The results state that there is a strong positive correlation between the nutritional fodder given to cows per day and the quality of Milk in terms of Fat content. The result was significance at 95 % confidence. Further using simple regression $\hat{Y} = -0.7337 + 1.2323X$ the researcher has found out that the impact of nutritional fodder on quality of Milk in terms of Fat content. This accuracy level of this equation was 0.4376%. Also, this equation is significant at 5% LOS as 0.001491
Key Words: Regression, Correlation, Nutritional food, A2 Milk

Introduction:

Dairy Farming is emerging with an exponential pace in India. Cow milk has been utilized around the world for its nutritive and restorative qualities in all age gatherings. The demand for milk is increasing every day. But the awareness of the safe milk to be consumed is very less. Though the dairy farmers are doing their best there is always a scope of improvement for the same. Mathematics is one of the fields of science which is applicable in each sector. To study the same there was a need to study the correlational study between the fat content of the milk and the nutritional food which is provided by the dairy farmers to the cows. The researcher has made an attempt to identify the if relationship exist between the variables and then finding the impact of the nutritional content on quality of milk in relation the fat content.

Research Methodology:

2.1 Research Problem:

The research problem identified by the researcher was the quality of milk of indigenous cows in PAN India, thus there was a genuine concern about the quality of milk in relation to the nutritional fodder which is provided to the cows. Thus, the pain area highlighted was weather there is a relation between quality of milk and nutritional food content and the impact of

2.2 Objectives of the Study:

Based on the Research problem, the following objectives were considered.

To Study the relation between the quality of Milk (in terms of Fat content) and nutritional food provided to the cows.

To study the impact of these nutritional fodder on Fat content of the milk.

2.3 Hypothesis Formulation:

Based on the objectives of the study the following hypotheses were formed.

H0: There is no relation between quantity of nutritional fodder and Quality of Milk (in terms of Fat content)

H1: There is a relation between quantity of nutritional fodder and Quality of Milk (in terms of Fat content)

2.4 Scope of Study:

Foe the purpose of completing the research an attempt was made by the researcher to restrict the scope of study to Junagadh district. Also, the scope of research was restricted only quality of milk and nutritional fodder consumed.

2.5 Research Design:

The research design deployed by the researcher was Exploratory in nature as the to define the research problem and to understand it secondary source of information has played a major role. Also, the research was Descriptive in nature too as it will explain the process of why this is happening by testing hypothesis.

2.6 Sampling Design: The sampling Design undertaken was simple random sampling method. The sample of 100 was undertaken of the indigenous cows.

2.7 Mathematical and statistical techniques used:

To analyse the data the mathematical statistics techniques used were bivariate correlation and simple regression techniques.

2.8 Research Tool:

Research instrument used for the data collection questionnaire. The questionnaire was unstructured and with open ended questions on Ratio Scale.

2.9 Limitations of Study:

1) Time and Cost were the primary limitations of the study.
2) The study was limited to Indigenous cow breeds of Junagadh district.
3) Only limited variables were taken for the study.

Data Analysis and Findings:

The data collected from the cow sheds of 20 cows was studied by researcher in the month of August 2022. To Study the first objective of finding the relation between the quality of Milk (in terms of Fat content) and nutritional food provided to the cows.

H0: There is no relation between quantity of nutritional fodder and Quality of Milk (in terms of Fat content)

H1: There is a relation between quantity of nutritional fodder and Quality of Milk (in terms of Fat content)

The above hypothesis is tested by the technique known as bivariate correlation technique.

Table: 1

Sr. No.	Nutritional fodder (X) (Kg)	Quality of Milk (in terms of Fat content) (Y)
1	3	2
2	1	4
3	2	1
4	5	4
5	4	1
6	5	4
7	6	9
8	5	4
9	4	1
10	5	4
11	6	9
12	1	4
13	2	1
14	5	4
15	4	1
16	5	4
17	6	9
18	5	4
19	6	9
20	6	9

Source: Survey

Findings:

The above hypothesis is tested by Correlation and its significance is tested by t test.

Using Karl Pearson coefficient r= 0.66

The P-Value is .001542. The result is significant at $p < 0.05$.

Thus, we Reject H0

There is a relation between quantity of nutritional fodder and Quality of Milk (in terms of Fat content)

For the data, the regression equation for Y is:

$\hat{Y}$ = -0.7337 + 1.2323X

2. Goodness of fit

Reporting linear regression in APA style

X predicted Y, R2 = .44, F(1,18) = 14.01, p = 0.001

ß = 1.23, p = 0.001

1. Y and X relationship

R Square (R^2) equals **0.4376.** It means that 43.8% of the variability of Y is explained by X.

correlation (R) equals **0.6615**. It means that there is a **strong direct relationship** between X and Y.

Overall regression: right-tailed, F(1,18) = **14.0051**, p-value = **0.001491**. Since p-value < α (0.05), we reject the H_0.

The linear regression model, $\mathbf{Y = b_0 + b_1X + \varepsilon}$, provides a better fit than the model without the independent variable resulting in, $\mathbf{Y = b_0 + \varepsilon}$.

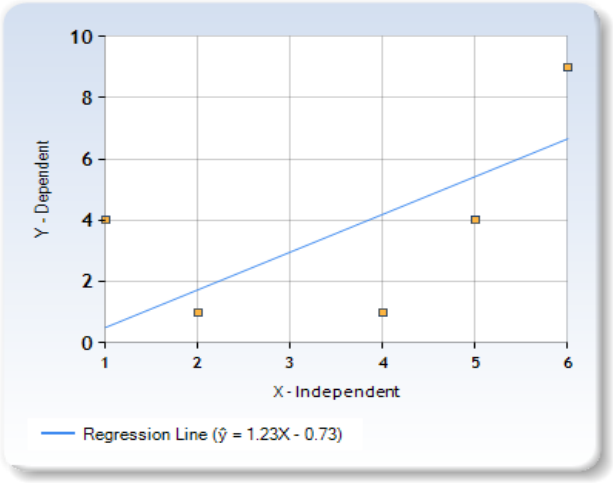
The Slope (a): two-tailed, T(18)=**3.7423**, p-value = **0.001491**. For one predictor it is the same as the p-value for the overall model.

The Y-intercept (b): two-tailed, T(18) = **-0.4703**, p-value = **1.3562**. Hence b is not significantly different from zero. It is still most likely recommended not to force b to be zero.

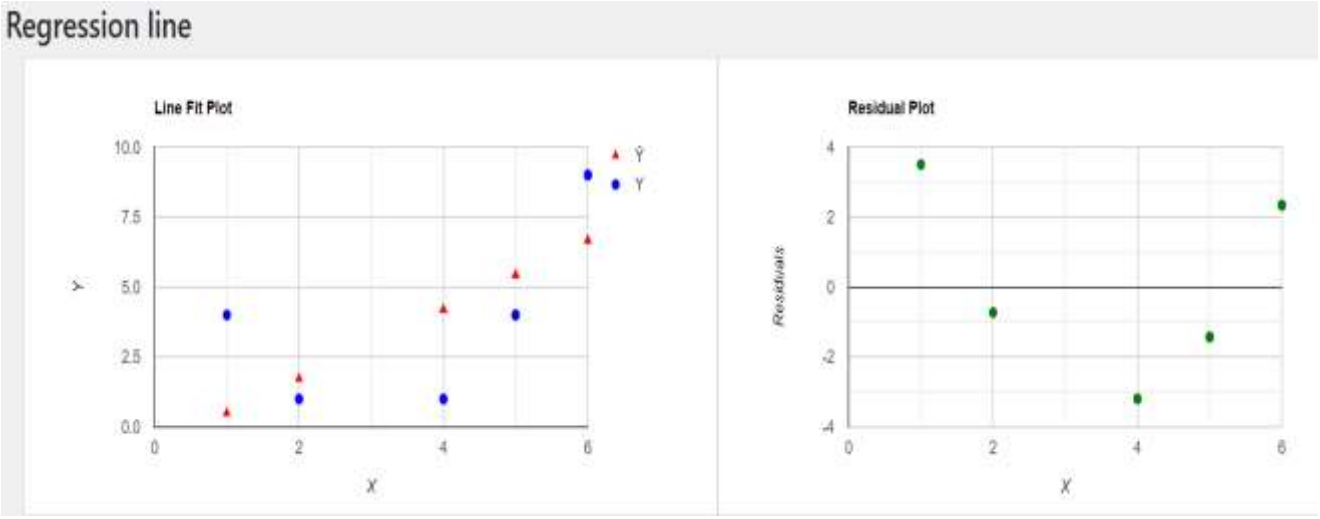
3. Residual normality

The linear regression model assumes normality for residual errors. Shapiro will p-value equals **0.004646**. It is assumed that the data is not normally distributed. You should consider transformation, or taking a bigger sample.

4. Outliers: The data does not contain any outliers.



Source: MYSTAT



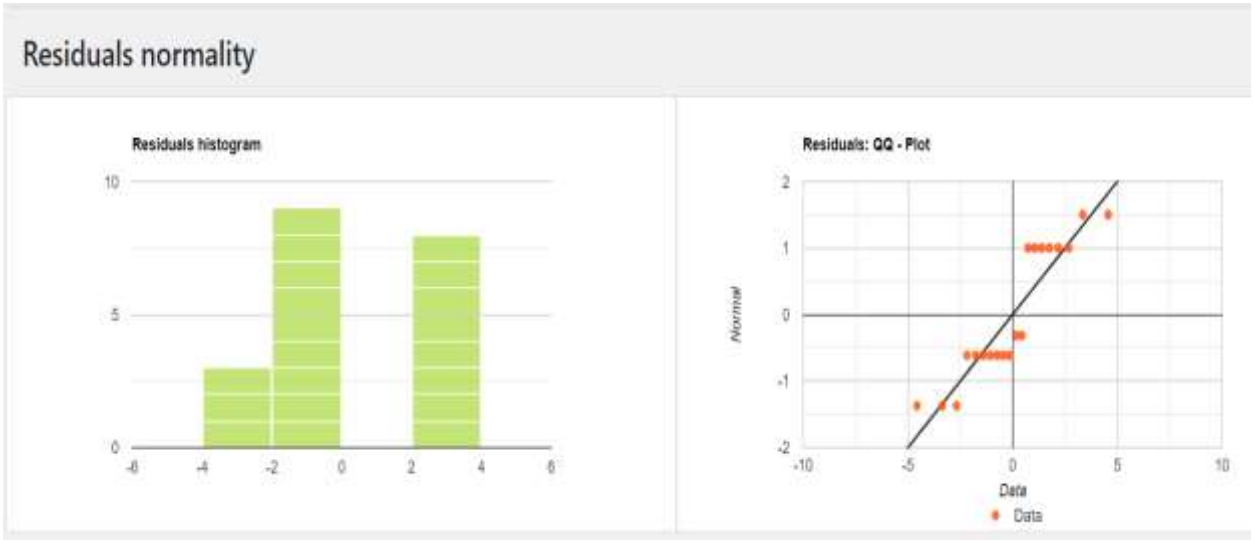
Source: Sociostatistics

Regression ANOVA

Hover over the cells to see the formulas.

Source	DF	Sum of Square	Mean Square	F Statistic (df_1,df_2)	P-value
Regression (between $\hat{y}_i$ and $\bar{y}$)	1	80.4072	80.4072	14.0051 (1,18)	0.001491
Residual (between y_i and $\hat{y}_i$)	18	103.3428	5.7413		
Total (between y_i and $\bar{y}$)	19	183.75	9.6711		

Source: Sociostatistics



Source: Sociostatistics

Conclusion:

From the above findings the researcher concludes that there is a relation between the quality of milk in terms of Fat and the nutritional food provided to the cows. This will give you the role of nutritional food to be given to the cattle so that not only quantity but quality of milk can be improved. Further to the discussion from the regression equation which is formed by the researcher, this highlights how significant the prediction equation is for quality of milk in terms of Fat content and nutritional value. The regression equation has overall significant value which is less than 0.05. thus, this equation can be used by the dairy farmers to increase the fat content of the milk so that they get best price of the milk per litre.

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EDUCATION FOR SUSTAINABLE DEVELOPMENT - AN ANALYSIS OF TEACHING TECHNIQUES OF ESD PEDAGOGIES FOR PROMOTING ENVIRONMENTAL SUSTAINABILITY AMONG HIGHER SECONDARY STUDENTS

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Abstract
Sustainable development is considered as one of the greatest challenges of 21stcentury. Every phase of education is now being urged to declare its support for Education for Sustainable Development (ESD). The present study analyzed the teaching techniques of ESD pedagogies preferred by the teachers for promoting environmental sustainability among Higher Secondary students. The sample selected for the study involves 50 Higher Secondary School Teachers. The method adopted was survey cum descriptive. The findings revealed that Issue Analysis Technique is the most preferred and appropriate teaching technique for promoting environmental sustainability among students.
Key Words:
Education for Sustainable Development, Environmental Sustainability, ESD Pedagogies, Teaching techniques, Issue Analysis Technique, Simulations, Class Discussions

Introduction

Education for sustainable development is a major concern for the 21st century society. It is the key premise of the United Nations sustainable development goals, which emphasize the need for everyone to have the knowledge and skills to meet the challenges of creating a more sustainable world. The socio-economic changes in the world and developing information and knowledge, society have emphasized the importance of sustainable development as a higher order social goal that challenges the growth ethics and increasing inequity of modern life. The concept of sustainable development was described by the 1987 Brundtland Commission Report as *"development that meet the needs of the present without compromising the ability of future generation to meet their own needs*". The overall goal of sustainable development (SD) is the long-term stability of the economy and environment which is achievable only through the integration and acknowledgement of economic, environmental, and social concerns throughout the decision-making process. The ethics and principles that inspire sustainability include broad concepts such as equity among generations, gender equity, peace, tolerance, poverty reduction, environmental preservation, natural resource conservation and social justice. Sustainability is a paradigm for thoughtful future in which environmental, social and economic considerations are balanced in the quest of development and an improved quality of life. These three spheres- society, environment and economy are intertwined. The sustainable development programs must consider these three spheres of sustainability also with the underlying dimension of culture. Sustainable development should address the local contexts of these three spheres.

Sustainable development is a dynamic, ongoing process rather than a static desirable state. It begins with education. Education is a powerful policy tool for social change. It is a most powerful and strategic implement for creating new knowledge as well as for the growth and development of human resource which can take responsibility for economic, social and scientific growth and sustainable development of the country. ESD, in its widest sense, is education for social transformation with the goal of creating more sustainable societies. Hence, ESD often called Education for Sustainability (EFS). ESD traces every aspect of education including planning, policy development, finance, programme implementation, curricula, teaching-learning, assessment and administration. ESD aims to offer an intelligible interaction between education, public awareness, and training with a view to creating a more sustainable future. It has to emphasis the four zones as i) improving assess and retention in quality basic education ii) reorienting existing educational

programmes to address sustainability and increasing public understanding and awareness of sustainability and iv) providing training to all sectors of the workforce.

In ESD, reorienting a curriculam to address sustainability can take place at a classroom or national level. At the classroom level, teachers can begin by explicitly stating the link between the topic in the mandated syllabus and sustainability. By using a variety of teaching techniques to meet the learning needs of pupils, teachers can address these areas effectively in the classroom. Pedagogies associated with the ESD should stimulate pupils to ask questions, analyze, think critically and make decisions. Such pedagogies move from teacher- centred to student centred lessons and from rote memorization to participatory learning. ESD pedagogies can promote principles of environmental sustainability. The concept of environmental sustainability is the concern about natural environment and its possible means to become productive and resilient to support human life. Environmental sustainability conveys to ecosystem integrity and carrying capacity of natural environment (Foster,2002).

ESD Pedagogies

ESD pedagogies are place- based or problem/issue- based pedagogies. ESD pedagogies encourage critical thinking, social critique, and analysis of local contexts. They involve discussion, analysis and application of values. ESD pedagogies often draw upon the arts using drama, play, music, design and drawing to stimulate creativity and imagine alternative futures. They work towards positive change and help pupils to develop a sense of social justice and self -efficacy as community members. The following are some of the teaching techniques of ESD pedagogies (source; Education for Sustainable Development in Action -UNESCO Education Sector Learning and Training Tools, 2012)

1. Simulations
2. Class Discussions
3. Issue Analysis Technique

Each technique stimulates different learning processes.

Need and Significance of the study

Creating and living in a more sustainable world requires knowledge and skills for living sustainably and having sustainable livelihoods. The disconnection between the curriculam and life in the community is a factor in children and adolescents dropping out of schools. Making the curriculam more directly related to the lives of children and adolescent is important to retention. Preparing pupils to fill the “green jobs” of tomorrow is an important part which can pave the way to achieve the desired goal of sustainable development. Education for sustainable development has become an important issue in society. The united nations Decade for Education (DESD,2005-2014) has encouraged innovative approaches in education in order to contribute to the societal change towards sustainability through both the formal education, non-formal and informal learning settings (Buckler and Creech, 2014).

Education should orient to address sustainability examines real-life problems in the community and explores solutions, thereby adding relevance to the curriculam by connecting it to learners’ felt needs. The quality education should consider and address the needs of individual learners while developing and delivering lessons. By using a variety of teaching techniques, the teachers can attend to the diverse needs of the pupils in the class and can help pupils employ and develop different learning process related with sustainable development. Meeting the learning needs of all pupils in the classroom is a form of social equity, which is a core concept of sustainability which ensures opportunity for the pupil to grow as learners and to enhance their skills and capacity to learn and think on sustainability.

Environmental sustainability in each and every field is need of the hour. It is the responsibility of each individual to conserve natural resources and protect global ecosystems to support health and wellbeing, now and in the future. The essential characteristics, issues, challenges and solutions of the problem of environment should reflect in teaching-learning process. It is possible only if the educator adopting suitable teaching techniques. Understanding of different teaching techniques of ESD pedagogies are therefore very crucial. Need and significance of the study is hence justified.

Statement of the problem

Education plays an important and critical role in socio-economic, cultural and political development of a nation. It greatly

influences every domain of life and has fundamental role in sustainable development. The crucial ways and means for sustainable development are predictable only through education. By using a variety of teaching techniques to meet the learning needs of pupils, teachers can promote sustainable development through education. The present study analyses the teaching technique preferred by the teachers for promoting environmental sustainability among Higher Secondary students. The present study is hence entitled as "***Education for Sustainable Development - An Analysis of Teaching Techniques of ESD Pedagogies for Promoting Environmental Sustainability among Higher Secondary Students*".**

Objectives

1. To identify the teaching techniques of ESD pedagogies preferred by the teachers for promoting environmental sustainability among Higher Secondary Students.
2. To analyze the impacts of preferred teaching techniques of ESD pedagogies on Higher Secondary Students for promoting environmental sustainability.

Hypotheses

1. Teachers prefer different teaching techniques of ESD pedagogies for promoting environmental sustainability among Higher Secondary Students.
2. Teaching techniques of ESD pedagogies have significant impact on Higher Secondary Students for promoting environmental sustainability.

Methodology

Method

The investigator adopted descriptive -survey method for the study as it affords opportunities for determining the predominant conditions and it is essentially a technique of quantitative description of the characteristics selected for the study. Since the present study aims to identify the teaching technique of ESD pedagogies preferred by the teachers for promoting environmental sustainability among Higher Secondary Students and also to analyze the impact of preferred teaching techniques on students, descriptive survey method was found suitable to the study.

Population

The population of the study involves Higher Secondary School teachers

Sample

Sample selected for the study involves 50 Higher Secondary School teachers working in Thiruvananthapuram, Kollam and Kottayam districts in Kerala.

Tool used for the study

The investigator developed a questionnaire consisting of closed and open-ended questions for the teachers to seek their preference of teaching technique and also to collect views on the impact of preferred teaching techniques on students for promoting environmental sustainability. The questionnaire consists of 25 questions related to different teaching techniques.

Procedure adopted for the study

The present study is online based. The questionnaire was administered to the sample through google form. The completed response forms were analyzed by using suitable statistical techniques.

Analysis and interpretation

The data collected were analyzed by using Bi-modal approach. The closed ended questions were analyzed quantitatively by calculating percentages. The qualitative analysis of the open-ended part of the questionnaire were used for collecting the views related to the impacts of teaching techniques on Higher Secondary Students for promoting environmental sustai

Table I

Teaching techniques of ESD Pedagogies for Promoting Environmental Sustainability among Higher Secondary Students

Teaching technique	Number	Percentage
Issue Analysis Technique	42	84%
Simulations	05	10%
Class Discussions	03	6%

From table 1, it is obvious that ,out of the total sample {N=50}, majority of the teachers (84%) prefer Issue analysis Technique as excellent teaching technique for promoting environmental sustainability among Higher Secondary students where as

10% of the sample are in favor of simulations and only 6% of teachers opined class discussions as good teaching technique for promoting environmental sustainability among Higher Secondary Students. Interpretations and explanations of the above-mentioned findings were given below.

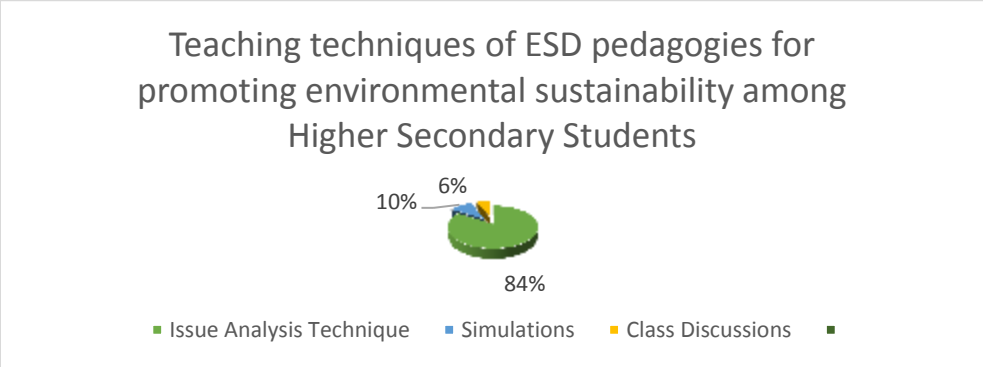

Figure I Teaching techniques of ESD Pedagogies for Promoting Environmental Sustainability among Higher Secondary Students

Issue Analysis Technique

Issue analysis is a structured technique for exploring the environmental problems that faced by the communities. Issue analysis helps learners to identify the major arguments related to a community problem as well as key stakeholders and their perspective, goals and assumptions related to that particular problem.

Advantages of Issue Analysis Technique as teaching technique for promoting Environmental sustainability among Higher Secondary Students

1. Issue analysis guides students through a process that can be used with any issue related with environment.
2. It is a generic process that can be applied to a wide range of environmental social and economic problems.
3. It enables the students to look critically at the proposed environmental problems, issues solutions and the costs.
4. It can be done briefly or in depth and hence it provides opportunity to analyze the environmental aspects under different range and perspectives.
5. Issue analysis technique is interdisciplinary and hence ensure correlation of different areas of knowledge to promote dynamic understanding of environment.
6. It helps the learners to untangle the complexities of sustainability issues that face their communities through direct involvement.
7. It gives pupils a way to critically analyze and holds with the feeling that something is not fair in their own community and in communities around the world.
8. It promotes higher order thinking skills, critical thinking skills, decision -making skill and positive thinking about the future of the environment.
9. It enables learners to create solutions that are locally appropriate and at the same time keep in mind on global consequences. (e.g.; cleaning up local soil pollution without delivering toxic and harmful waste to another place)

Simulations

Simulations are teaching / learning scenarios in which the teacher defines the contexts in which the pupils interact. The pupils participate in the scenarios and gather meaning from them. Simulations are simplifications of complex abstract concepts.

Advantages of Simulations as teaching technique for promoting Environmental sustainability among Higher Secondary Students.

1. Simulations are distillations of real-world situations they give a sense of reality to environmental aspects and issues and hence engage and motivate learners.
2. It makes environmental learning more readily generalized from the classroom to the real world.
3. It simplifies complex and abstract concepts of environmental sustainability

and give concreate ways to teach abstract concepts.

4. Simulations concentrate on learning through the process of problem solving which is the most effective way of developing understanding on environmental problems and challenges.
5. Simulations are effective in developing positive attitude towards the conservation of the environment and environmental resources.

Class Discussions

Class discussions allow for the transfer of information among students and from the students to the teacher, in addition to the traditional route from teacher to students. Students come to the class room with a variety of life experiences that can enrich the teaching of the mandated curriculam. Advantages of Class Discussions as teaching technique for promoting Environmental sustainability.

1. Class discussions provide opportunity to incorporate experiences into the lessons that provide pupils with real life applications of environmental concepts.
2. It develops one of the essential skills for ESD which is the ability to communicate orally and in writing.
3. Class discussions give pupils opportunity to develop oral communication skills such as developing focus and purpose before speaking, active listening, building on the ideas of others, summarizing and questioning.
4. It stimulates pupils to analyze and think critically on environmental issues and promote participatory learning.
5. Class discussions can be built into a lecture or around a list of questions, a problem to solve, a plan to be made or an activity to be completed. All of these ensure active and participatory learning of environment.

Tenability of Hypothesis

Education is vital to sustainable development. The education of today is critical to refining the ability of the leaders and citizens of tomorrow to make solutions and find novel paths to a better, more sustainable future. A quality education implies that the needs of the individual learners will be considered and addressed in developing and delivering lessons. By using a variety of teaching techniques of ESD pedagogies, teachers can attend to the diverse needs of the students in the class for promoting environmental sustainability. The proposed Hypothesis I ***Teachers prefer different teaching techniques of ESD pedagogies for promoting environmental sustainability among Higher Secondary Students*** is therefore, accepted. The findings also unveiled the fact that each teaching technique of ESD pedagogies has unique impacts on students. Therefore, the proposed Hypothesis II, ***Teaching techniques of ESD pedagogies have significant impact on Higher Secondary Students for promoting environmental sustainability*** is also accepted.

Major Findings

1. Teachers prefer different teaching techniques of ESD pedagogies for promoting environmental sustainability among Higher Secondary Students.
2. Issue Analysis Technique is the most preferred teaching technique of ESD pedagogy for promoting environmental sustainability among Higher Secondary Students.
3. The teaching techniques of ESD pedagogies have significant impact on Higher Secondary Students for promoting environmental sustainability.

Conclusion

In order to live in a more sustainable world, educational system has to rethink the purpose, the content, assessment as well as the teaching techniques. Education acts as an efficient mechanism to bring about social transformation and thus generate more stable, equitable and resilient societies. Education, within an ESD framework can address difficult local or global changes and contemporary challenges associated with the environment. Enlightening education system with the purpose of sustainability enables the present generation to meets the needs without compromising the ability of future generations to meet their own needs.

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Disasters management and Public participation!

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Abstract:
The most beautiful gifts given by nature include air, water, trees. But if the same air assumes a violent form, if the same water shows evil qualities, if the same tree leaves its support, a great calamity may occur. A disaster is a crisis that causes large-scale loss of life, economic and social life to a nation or society and has far-reaching effects on that nation or society. Such a crisis is called a disaster. Disasters are events that have a major impact on humans and the environment. Disasters are unpredictable. A natural disaster is a very terrible and dangerous phenomenon that occurs suddenly and usually causes damage to houses, property, goods and many other types and also causes many deaths. Due to human mistakes, it is increasing day by day as human beings misuse the ecological resources. There are many types of natural disasters such as volcanoes, floods, earthquakes, droughts, landslides, cyclones, tsunamis, avalanches, thunderstorms, heat waves and lightning. Due to some disasters, the economic backbone of the countries has been broken. For this, people should be educated about this disaster, information should be exchanged, training should be given to deal with these situations, a sense of security should be instilled in the general public, financial and medical assistance should be provided to the disaster affected people quickly and proper management should be done during the disaster, it should be the aim of the government, and at the same time the people should also participate. Unfortunately, the poor people of the world are the sure victims of this natural disaster. Recent tsunamis, volcanoes, earthquakes are recent examples of this. For this, the governments of the country and the country hold hands with the media and make a declaration and explain its reasoning to the people

.Introduction:

Disasters have befallen the earth since eternity. Some of the frequent disasters are natural, while others are man-made. Disaster management systems have recently been implemented by all countries to prevent or reduce the loss of lives and property caused by disasters. Disaster management cycle is an important and fundamental principle in the system of disaster management. If the damage caused by disasters is to be avoided, it is important to predict disasters before they occur, plan anti-disaster preventive measures, mitigate disasters and take appropriate preventive measures during disasters. As India is a country of biological, cultural and geographical diversity, it is also considered as a country of various destructive disasters. The prevalence of disasters in India greatly hampers its development. 58 years after the independence of the country, with the Disaster Management Act, the very important subject of disaster management has received statutory form. Therefore, a well-planned, comprehensive and sustainable disaster management system has been started. The last decade of the 20th century was declared by the United Nations as the decade of 'Disaster Risk Reduction'. All the nations tried to establish *Dandaka* according to their own management. Many *Dandaka* have been established around the world to reduce the risk. One thing that is universally recognized is that risk reduction measures are more important than post-disaster measures. In India, after the Odisha cyclone in 1993, the central government set up a committee to conduct a comprehensive study of the hazards and the resulting disasters. Also, India started efforts to bring coordination between all departments of management, scientific research institutes, educational institutes and general public as well as rescue organizations for relief work during the crisis. But due to the Tsunami in 2004, the urgency of making a Disaster Management Act was missed.

'Disaster Risk Reduction'

phases of disaster management-

1) Pre-Disaster Management - This includes training, public awareness activities, practice and demonstration of the system, preparation of disaster management plan and keeping the system equipped, liaison and coordination with various disaster response forces.

2) Disaster Management- Planning relief work in case of actual emergency and maintaining coordination among relief systems.

3) Post Disaster Management- Controlling the relief work to be done after the disaster, proper implementation of the relief and rehabilitation plan, etc.

natural disaster Natural calamities such as earthquakes, volcanoes, storms, floods, cloudbursts make people weak enough. You have to be constantly alert for that. Specially trained people have to be prepared to deal with these disasters. Internationally, the second Wednesday of October is reserved for this and the activities to be done to curb these disasters are reviewed. The United Nations General Assembly on December 22, 1989 declared the present day for the prevention of natural disasters. The period 1990-99 was declared as the Decade for Prevention of Natural Disasters and during this period the day was celebrated on the second Wednesday of October.

Public Participation

Natural calamities occur suddenly, especially due to climate change. Therefore, the possibility of loss of life and money in such a natural disaster cannot be ruled out. We also see in daily life if a vehicle meets with a major accident or a person is injured in an accident, many people in the society rush to treat them and save their lives. Overall, this positive action is done by the society itself due to human sensibility and proper attention is also taken by the administration, that is why the relationship between disaster management and people's participation is very close.

Earthquakes, floods, cyclones and heavy rains are all-natural disasters. Not only this, the central government has passed the Disaster Management Act in 2005. Its basic purpose is to prevent losses in natural calamities and provide safety to all. Although this program is implemented by the administrative machinery, public participation is equally important to combat the crisis situation.

Need for disaster management at local level:

Initially, the villagers have to be bravely prepared to face the flood or other natural calamities coming to the village. There is a need for management at the local level to increase the morale of the citizens. To face the constant calamities every year, to face the sudden calamities, to ensure minimum loss of lives and finances, to protect the most vulnerable sections of the population, preparations must be made to ensure that daily life is not disrupted after a disaster.

During the disaster and after the disaster, especially minor children, elderly, women and the disabled, besides providing water supply, animal fodder, catering system, medical services, medicine materials, Sewage system etc. will work smoothly. Disaster management at the local level is necessary to ensure this. For that, it is necessary to get people's participation equally spontaneously.

Plans being made at departmental level:

A control room is established at the departmental level. Similarly, instructions have been given to establish district and taluka level control rooms. The service of this control room should be available 24 hours. Disaster management is a very big and broad subject. If you search the internet on this subject, you will find numerous books, articles and websites. It is impossible to take a comprehensive review of all this. However, we can definitely try to get the necessary information in practice so that we can try to save our lives in dire situations like disasters. We all know what happens if you dig a well when you are thirsty. So just as it is preferable to provide water before the onset of thirst, instead of running to save lives after a disaster, it is always advisable to plan and prepare a disaster relief plan in advance rather than looking for solutions.

We all agree that prevention is better than cure. Precautions taken before an accident occurs are always beneficial. First aid is the first thing that comes to mind when you think of an accident. We all know that first aid is the simple measures taken to reduce the possible consequences of the injury or the risks arising from it before getting medical help in the event of an accident. Like holding the injured body part under cold water to relieve the pain or using turmeric to stop the blood flow etc... In short, disaster management means reducing the damage as much as possible by studying the side effects of disasters at all levels such as loss of life, financial loss, social loss. Various measures and measures planned to be taken. If we look at it in our India, there are different types of calamities like drought, flood, earthquake, tsunami, cyclone, fire, communal riots, terrorism at the same time.

Usually of disasters, it is classified as such:

1. Natural calamities- Drought, Flood, Earthquake, Tsunami, Cyclone etc.

2. Man-made calamities- fire, communal riots, terrorism etc.

Our country India is considered to be the largest natural disaster prone country in the world. Approximately 50% of India experiences earthquakes, 30% of droughts, and 10% of floods. Also, various types of communal riots, terrorism, fires are also seen happening frequently.

Today we all feel blessed to blame the government when any kind of calamity happens. But if we start realizing our responsibility as citizens, things can change a lot.

Challenges in disaster management:

- Attentional imbalance
- Coping with uncertainty
- Situational awareness
- Education and training for that team can be very difficult as for disaster management
- Developing countries
- Cross organization relationships
- Communicating with people during disasters

Conclusion:

Preparations are being made on war level by the administration to deal with natural calamities. However, public participation is equally important in coping with crisis situations. . The Departmental Disaster Management Authority is coordinating with the District Disaster Management Authority under the guidance of the Divisional Commissioner, measures are being taken as per plan from the district level to the village level in order to maintain the security system in the pre-monsoon as well as during the rainy season. Local level is also important in disaster management. On behalf of the District Disaster Management Authority, preparation of the District Disaster Plan at the district level, updating it, organizing various workshops and activities such as color rehearsals should be implemented at the district and taluka level. Training of members of village disaster management committee, training of office staff, staff of voluntary organizations and public awareness should be done through street plays, billboards, poster competitions, etc. programs to increase public participation. The administration is ready to handle any possible situation that may arise. But due to the flood situation, necessary instructions should be given to the health system to control epidemics, the *Mahavitaran* Company to maintain the electricity supply, the telecommunications department to keep the telephone service in good condition, the public works department, the state transport corporation, the irrigation department and other related departments to ensure that the roads are connected to the traffic. Along with the administrative system, school college students, NCC, home guards, police administration, NGOs, social workers etc. are mainly involved in emergency situations. Also, in emergency situations, villagers also need to take initiative and cooperate with the security system.

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The New Perspectives of Motherhood Advances In India: Maternity Benefit Act

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Research Guide

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Abstract
In the patriarchal society women is said to be the multi tasker in all the field there are many right and fundamental duties that is given to them. In a reformist civilization , it has been gradually realized that women end to end with the men play a protagonist performance in making the nation flourish and as well as raising the financial economic of country . There has been a substantiation of tremendous revolution in the status of women with increasing their engagement in labour market, even though the leaning towards their social protection and social security is still under the certainty and disappointing. The usual occurrence behind this mentality of the society is the opinion of women as housewives, caregivers, mothers, and secondary sources of household activities. But now the time has come to change this traditional perception of the society. The government of India, to ensure gender impartiality has passed number of legislations which provide employment benefits such as wage benefits, better working conditions, maternity benefits and social security. Maternity benefits act as organizer which believed to create an environment that assist and improve a women worker's capability to maintain balance in work and family engagements

Introduction

Life has prepared women to give birth to child in order to keep the generations going on. Bearing of child is also afamily as well as social obligation of a married woman and an employed married woman cannot be an exception or immune from this obligation. Thus maternity cannot be ignored. Traditionally, maternity has been preserved as a state of incapacity in women workers from taking any responsibility any work during the few weeks immediately preceding and following child birth.1 With the emergence of the system of wage labour in the industrial undertakings, many employees tended to terminate the services of the women workers when they found that maternity interfered with the performance of normal duties by women workers. Many women working in any industry,firm institution therefore, had to go on leave without pay during this period in order to retain their employment. Many others had to bear a strong stress to keep their proficiency during the periods of pregnancy, which was injurious to health of both, the mother and the child. To eliminate this suffering of the women workers, the concept of maternity benefit came into picture in order to facilitate the working women to carry on the social function of child; bearing and nurturing without unnecessary pressure on their physical condition and loss of wages. Looking at the large number of women employment in broad occupational categories, it was but natural the shielding laws to preserve their in relation to maternity and the children are enacted by the central and state governments. Article 42 of our Constitution contains the directive that the State shall make provision for securing just and humane conditions of work and maternity benefit.

The Maternity Benefit Act, 1961

The Maternity Benefit Act 1961 expands to the complete India and concerns to every manufacturing works, mine, plantation industry including any such establishment belonging to government but excluding the entire establishment covered under the provisions of the Employees' State Insurance Act, 1948. The Act also impacts to shops & commercial establishments in which 10 or more persons are employed or were employed for the exhibition of equestrian, acrobatic and other performance. In Municipal Corporation of Delhi V. Female Workers (Muster Roll), the supreme Court held that to provide all the

conveniences to the women The Maternity Benefit act in a distinguished manner so that she my speechless the state of motherliness proudly uninterrupted without fear of being persecuted for forced absence during the pre or post natal period"

Benefits Covered Under the Act

The Act requires a duty on the worker not to employ knowing women worker in any establishment during the six weeks immediate by following the day her delivery or her miscarriage or medical termination of pregnancy. No woman shall work in any establishment during the 6 weeks immediately following the day of her delivery or her miscarriage. On a request being made by the employed woman, the employer shall not require such women to do any work- which affects ill impact on her pregnancy or the regular expansion of the fetus or any work which is likely to cause her miscarriage or otherwise to adversely affect her health.

Every woman shall be entitled to & her employer shall be liable for the payment of maternity benefit at the rate of the average daily wage for the period of her actual absence, i.e.

a- the period immediately preceding the day of her delivery,

b- the actual day of her delivery and any period immediately following that day.

Conditions for Claiming Maternity Benefit

Maternity benefit can be claimed only when a women has actually worked in an establishment of the employer from whom she claims maternity benefit, for a period of not less than eighty days in the twelve months immediately preceding the date of her expected delivery.

Extent of Maternity Benefit

The extreme time for which any women shall be entitled to maternity benefit shall be twenty-six week of which not more than eight weeks shall precede the date of her expected delivery . Provided further that where a woman dies during this period, the maternity benefit shall be payable only for the days up to and including the day of her death:

Provided also that where a women, having been delivered of a child dies during delivery or during the period immediately following the date of her delivery for which she is entitled or the maternity benefit, leaving behind in either case the child, the employer shall be liable for the maternity benefit for that entire period but if the child also dies during the said period then for the days up to and including the date of the death of the child.

After sub section (3) of following provision shall be inserted namely

" Provided that the maximum period entitled to maternity benefit by a women having two or more than two surviving children shall be twelve weeks of which not more than six weeks shall precede the date of her expected delivery".

Sub section (4) provides that a woman who legally adopts a child below the age of three months or a contracting mother shall be entitled to maternity benefits for a period of twelve weeks from the date the child is handed over to the adopting mother or the commissioning mother, as the case may be.

Sub section (5) in case where the nature of work assigned to a women is of such nature that she may work from home, the employer may allow her to do so after availing of the maternity benefit for such period and on such conditions as the employer and the women may mutually agree. Why is Sec 2 of the Maternity Benefit Act, 1961 important?

The Maternity Benefit Act 1961 has laid importance on providing payment of medical bonus to the beneficiary by her employer upto 1000 rupees if no pre-natal confinement & post natal care is provided for by the employer free of charge. The amount of medical bonus is increased to 20,000 rupees by the central government.8 The woman is entitled to get leave with wages in case of miscarriage or any kind of complication during pregnancy. On the proof of any illness arising out of pregnancy an additional leave with wages for a period of 30 days is granted to the beneficiary. After returning to duty, the mother shall be entitled to interval of rest and be permitted to two breaks to feed the child until the

child attains the age of 15 months. The establishment having fifty or more women workers shall have the 'facility of crèche' at convenient places. On the proof given the women shall be entitled to leave with wages for Tubectomy operation. The Act provides that it shall be unlawful for her employer to discharge or dismiss a pregnant woman during or on account of her absence or to give notice of discharge or dismissal on such a day that the notice will expire during such absence or to very to her disadvantage any of the condition of her service. The Act states that no deduction of wages is allowed by reason of light work assigned to a pregnant women & breaks for feeding the child.

National Maternity Benefit Scheme

Under NMBS, cash assistance of Rs. 500/- is provided to the women of household below poverty line and 19 years of age and above, up to first two live births, it covers both pre-deliver payment and post delivery payment. The scheme is into an action since 1995. The scheme aims at to assure monetary aid to the needy women at the time of their pregnancy and in case of the death of the child the women can still get the benefit of the same. To improve its efficacy and coverage the National Maternity Benefit Scheme (NBMS) got updated by modified scheme called "Janani Suraksha Yojana" (JSY).

Janani Suraksha Yojana

In 2005 the National Rural Health Mission initiates a centrally sponsored program called Janani Suraksha Yojana with a primary motive to reduce maternal and neonatal mortality by promoting institutional delivery among the women belong to vulnerable segment of the society. The yojana divides low-performing states (LPS) and high-performing states (HPS) depending on the pre-programme level of institutional deliveries. The Janani Suraksha Program introduced frontline health workers, called Accredited Social Health Activists (ASHAs). Monetary Assistance is granted to the selected target beneficiaries with deliver and post delivery care.

Vande Mataram Scheme

This is a voluntary scheme wherein any obstetrical and gynecological society of India and private clinics can volunteer themselves for providing safe motherhood services. The aim of the scheme is to reduce the maternal mortality and morbidity of the pregnant and expected mothers by involving and utilizing the vast resources of specialist / trained workforce available in the private sector. The scheme intends to provide free antenatal and post natal check up, counselling on nutrition, breastfeeding through public private partnership etc.

Pradhan Mantri Matru Vandana Yojana

Pradhan Mantri Matru Vandana Yojana is a maternity benefit program initiated by the government of India with effect from 2017 to provide cash incentive of rupees 5000 to pregnant women and lactating mother. The Yojana aims at to provide partial compensation for the wage loss in terms of monetary assistance so that the woman can take adequate rest before and after delivery of the first living child. The benefit under the scheme is

PRADHAN MANTRI SURAKSHIT MATRITVA ABHIYAN

The government of India begins Pradhan Mantri Surakshit Matritva Abhiyan to guarantee quality antenatal care (a type of preventive healthcare) to expectant women in the nation. Under the Abhiyan a minimum package of preventive healthcare service would be given to the beneficiaries on the 9th day of every month at the Pradhan Mantri Surakshit Matritva Clinics to introduce wholesome lifestyles that benefit both mother and child.

2. Unpleasant Impact Of The Maternity Benefit (Amendment) Act 2017 On Employability

Seeing women workers as a duty- Many of the employers in private firms may avoid giving jobs to such women who may enter intro pregnancy period as they are under an obligation to grant them maternity leave and payment for that period (upto 26 weeks). After the amendment many of

employers takes the women employee as a burden.

Growth in costs of production- A sole responsibility of employer for full payment of wages during the specified period increase costs for employers.

The amendment creates a financial nervousness in the minds of employer's, it could result in increased preference for hiring male workers.

Loses due to enhanced maternity leave with benefits to industries engaging predominately women workers.

Reduces the employment opportunities for women workers, employers are either not very keen on hiring female workers or they are being asked to leave just before maternity to avoid additional liability.

3. Judicial Rejoinder

The judiciary has played a fundamental role for ensuring maternity benefits to the women in India by giving explanation to true intention of legislations and schemes In B. Shah V. Presiding Officer, Labour Court Coimbatore, The Supreme court regarding the significance of maternity benefit to woman employees observed that it has to her kept in mind that in interpreting the provision of beneficial pieces of legislation like Maternity Benefit Act, 1961 which is intended to achieve the object of ensuring social justice to female employee employed in the plantation and which squarely fall within the purview of Article 42 of the Constitution, the beneficent rule of construction which would enable the woman employee not only to subsist but also to make up her dissipated energy, nurse her child, preserve her efficiency as a worker and maintain the level of her previous efficiency and output has to be adopted by the Court.

In Municipal Corporation of Delhi V. Female Workers (Muster Roll) and another, in this case the Supreme Court held that there is nothing in the Act which entitles only regular woman employees to the benefit of maternity leave and not to other female employees who are employed on casual basis or on the muster roll in daily wages basis. To become a mother is most natural phenomenon in the life of a woman. Whatever is needed to facilitated the birth of a child to a women who is in service, the employer has to be considerate and sympathetic towards her must realize the physical difficulties which a working women would face in doing her duties at the work place while carrying a baby in the womb or while rearing up the child after birth. The Maternity Benefit Act, 1961 aims to provide all these facilities to a working woman in a dignified manner so that she may overcome the state of motherhood honorably, peaceably, undeterred by the fear of being victimized for forced absence during the pre or post natal period.

In Mrs. Savita Ahuja V. State of Haryana & others, The Hon'ble court held that merely because the appointment of the petitioner was purely on temporary/adhoc basis, she should not be disentitled to maternity leave. She is entitled to grant of maternity leave on full pay for the period of confinement & that termination of her service on account of her pregnancy was illegal. Therefore maternity leave also be granted to such female government employees who have been recruited on ad-hoc basis. In J. Sharmila V. The Secretary to Government, Edu. Deptt. Madras,The questions raised in the writ petition was that whether a married woman Government servant is entitled to get fully paid towards maternity leave availed if she has already two surviving children ? The petitioner had delivered during her first delivery twins and the second delivery was a single child. Therefore, the maternity leave was confined only to the second delivery and not based on the third child norm. The court held that it is suffice to state that if the intention of the State government is to afford protection of the woman for her second delivery, then it should not be based upon the number of children she delivers during those two deliveries. The importance has to be seen only from the health point of the women Government servant and not the numbers of children one delivers during each delivery. The petitioner who had availed maternity leave during her second

pregnancy is entitled to he paid full salary for the period. In K.C Chandrika V. Indian Red Cross Society, the post of the petitioner as appointed by the Red Cross Society as a clerk is temporary in nature but is likely to continue. The petitioner applied for maternity leave and the same is granted to her by the respondent. The duration of the leave was three months. While on leave, the petitioner was surprised to receive a communication from the respondents wherein it was stated that her services stood terminated. The question for determination was that whether termination of services of K. Chandrika is illegal. After taking into consideration all the relevant facts the Hon'ble court held that the respondent is directed to reinstate the petitioner in service with continuity of service for the purpose of computation of service benefits. So for as the grant of back wages in concerned, the workman may be called up to do a sacrifice which would be purely in public internet & therefore deserves to be paid wages.

In Smt. Archana Panedy V. State of M.P & others, the question in issue was that the petitioners a contractual employee is entitled to get the benefit of maternity leave. High court after taking into consideration the various judgment opined that when it comes to granting her the benefit of facilities required to give birth to a child the employer is duty bound under the Constitution to provide her all the amenities and that the Court see no reason as to why the benefit of Maternity Benefit Act should not be given to a woman contractual employee. The respondents are directed to grant maternity benefit to the petitioner.

Conclusion And Suggestion

To provide maternity benefit is a substantial piece of regulation/schemes which provides employment, health, economic security to a pregnant worker. Increasing maternity benefit is a welcome step but the government should make a blueprint to introduce such an effective mechanism that aims at to insure upon the benefits of employers so that the competitiveness of private sector is not affected by creating a burden on the entrepreneur. Recently to reduce the sole burden from the employers, the government of India came with a proposal to fund half of the paid leave amount that employers give in the extended maternity leave benefit scheme. The scheme is pending for approval. As per the proposal, the government will be ready to pay the salary for seven weeks of extended leave under maternity benefits. Beside the positive aspect of various schemes and legislation relating to maternity benefits its suffers from some drawbacks, which are

Under the Maternity Benefit Act, 1961 benefit only availed by a majority of women worker employed in the organized sector. In India only 4 percent of women of the total women workforce in India are employed in the formal sector. The moment a woman becomes pregnant she is seen as a burden. The Act is biased towards the workers in formal labour force.

The Act does not provide for paternity leave, it put the onus of the newborn's rearing on the mother. The inclusion of paternity leave is felt to be important to create a system through which a balance can be achieved to meet the responsibilities. The paid maternity leave period is discriminatory in a case of biological mothers it is 26 weeks & on the other hand for adopting & commissioning mothers it is only 12 weeks. It is important to note that time and attention required rising and looking after the child is similar in both the cases.The number of paid weeks reduces to twelve weeks in case of third birth; it has an impact on the upbringing of the child.

Increased maternity period creates a financial burden on the employers.

The amount as paid through various schemes is not adequate to meet out the exigencies of pregnancy**.**

An independent body should be constituted to analyze the application and progress of the Act.

Awareness towards the Act/ schemes through various means should be done at ground level.

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The Effect of Different Drying Methods on the Phytochemical Properties of the Selected Seaweeds

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Abstract

Seaweeds are good sources for the nutrition and pharmaceutical sectors. The intention of this study was designed to screen the constituent's selected seaweed collected from Rameswaram and Tuticorin, the Southern coast of India. The present study investigated the presence of phytochemical constituents of the green, brown and red seaweed under different types of drying methods. The extraction of some biochemical constituency stimulates productive application that needs desiccation stepwise to prohibit by removal of the synthetic composition and increases their real-life values and assist process which is consuming time and exhausting processes The valuable substratum of different seaweeds was studied by shade drying, sun drying Hot air oven drying at 60˚and 80˚c and Microwave drying (800w). The phytochemical effects of ethanol extract on different types of Seaweeds such as *Stoechospermum marginatum, Padina gymnosperms, Ulva Lactuca, Hypnea pannosa*, and *Centroceras clavulatum* were scrutinized. The phytochemical sources of Test for Alkaloids, Terpenoids, Steroids, Coumarin, tannin saponin flavonoids, Quinone, anthraquinones, protein, Phenol, and Carbohydrate were determined the Result, credentialed by the low-Temperature drying methods and high-temperature drying methods prepared product with highest chemicals are induced by drying treatment and the species of seaweed used Fast drying methods to be beneficial to the level of specific chemicals. The single drying method could be identified as consistently superior for all species or all compounds of instigating appropriate techniques selected air oven drying 60˚ method has the potential in the area of drying selective material to better stability of bioactive components which is helpful to use further studies in pharmacology and Agricultural fields

Keywords: Different drying, Hot air oven drying, Microwave oven, and Ethanol extract.

1. Introduction:

Seaweeds can be classified into three broad groups based on their pigmentation, Brown, Red, and green seaweeds. Brown seaweeds are usually large, and range from the giant kelp that is often 20m long, too thick, leather-like seaweeds from 2-4 m long, to smaller species 30-60cm long. Red seaweeds are usually smaller, generally ranging from a few centimeters to about a meter in length; however, red seaweeds are not always red they are sometimes purple, even brownish red, but they are still classified by botanists as Rhodophyceae because of other characteristics Green seaweeds are also small with a similar size range to red seaweeds. Seaweeds are also called macroalgae, edible seaweeds were widely consumed especially in Japan, China, Korea, Taiwan, Singapore and Thailand, Brunei, Cambodia, Vietnam, South Africa, Indonesia, Malaysia, Belize, Peru, Chile, Scandinavia, Southwest England d, Ireland, Wales, California, Philippines and Scotland Chan et al.,1997) and they are associated with a significantly lower rate of Cancer, Thyroid diseases, Heart diseases, Dementia and Diabetes (Cornish et al., 2010). In India, seaweeds are utilized by Industry mainly for the production of agar, alginate, and carrageenan through various reports that have mentioned their utilization in food, agriculture, cosmetics, and pharmaceutical industries. (Kumar et al.,2010), Gresslerv et a.,2010; Flora and Hamid et al,2018) Phytochemicals also referred to as phytonutrients, are found in fruits, vegetables, whole grains, legumes, beans, herbs, spices, nuts, and seeds and are classified according to their chemical structures and functional properties. The terminology used to describe phytochemicals (flavonoids, proanthocyanins, procyanidins be confusing. Phytochemicals include compounds such as salicylates, phytosterols, saponins, glycosylates, polyphenols, protease inhibitors,

monoterpenes, phytoestrogen sulfides terpenes, lectins, and many more. In seaweeds company seaweed dried used to manufacture same industry hence needs dehydration process is offered (Gupta et al.,2011) In this study we study different types of drying methods and their Phytochemicals

2. Materials And Methods:

2.1 Collection of Seaweeds:

Seaweeds were manually collected from the intertidal zone at Tharuvaikulam on February 14, 2021, and identified according to Bourelly (1972) and Guiry (2018). In the laboratory, the harvested fresh seaweed samples were thoroughly cleaned with tap water to ensure they were free from epiphytes, foreign biota, sand, and other surface contaminants and stored at 4°C until they were extracted.

2.2 Drying Methods:

In the Food sector, the Microwave oven drying method may be fast drying in limited periods which also so destroyed the story of seaweeds processing (Zhang et al.,2 010, Hamrouni-Sellami et al.,2013, Zielinka & Michalska 2016)

Samples of each seaweed species (Fresh) were divided into five equal portions (300 g wet. each species) and then dried using five different procedures.

Following are the different drying methods used in this study.

a) Shade drying method
b) Sun drying (or) Solar drying method
c) Hot air oven 60 drying method
d) Hot air oven 80 drying method
e) Microwave oven drying method

a) Shade drying method:

The shade dry method is one of the drying methods. In this method, the drying process is performed in a dark place away from sun exposure and appropriate airflow. The wet seaweeds were dried for 1-10 days at room temperature. After drying, 300 grams of dried seaweed were taken and ground to a fine powder.

The Shade dried samples were code-named *Centroceras clavulatum* (A1), *Stecospermum marginatum* (B1), *Padina gymnosperm* (C1), *Ulva Lactuca* (D1), and *Hypnea paranoia* (E1).

b). Sun drying method:

The next drying method is Sun drying method. In this method, the seaweeds are exposed to direct sunlight and are left to dry for 7 hours. The sun-dried samples were code-named *Centroceras clavulatum* (A2), *Stoechospermum marginatum* (B2), *Padina gymnosperm* (C2), *Ulva Lactuca* (D2), and *Hypnea paranoia* (E2).

C) Hot air oven (60°c) drying method:

A hot air oven method is another drying method. In this method selected five Species were kept in an Aluminium tray and placed in the oven at 60°C for 3 hours. After 3 hours they were collected and weighed. Then they were packed in the zip-lock pouches. These samples were then These samples were then code-named *Centroceras clavulatum* (A4), *Stoechospermum marginatum* (B4), *Padina gymgymnosperm*4), *Ulva lacLactuca*4), and *Hypnea paranoia* (E4).

D) Microwave oven drying method:

Glass plates containing the plant materials were placed in a microwave oven with the power strength adjusted to 800 W for 30 minutes. These samples were then code-named *Centroceras clavulatum* (A5), *Stoechospermum marginatum* (B5), *Padina gymgymnosperm*5), *Ulva Lactuca* (D5), and *Hypnea paranoia* (E5).

2.3. Preparation of Crude extract:

The dried seaweeds were then ground to a fine powder using a stainless-steel blender. The powdered form of dried seaweeds was subjected to solid-liquid extraction by using 100% Ethanol solvent. Each 1 g of dried seaweed sample was extracted by using 10 ml of solvent (100% ethanol) with a solid-to-solvent ratio of 1: 10 (w/v). The mixture of powdered seaweeds and ethanol was continuously swirled at 150 rpm in a shaker incubator for 2 hours at 37°C before being filtered using Whatman filter paper number 1. The residue was then re-extracted twice following the same procedure. The collected filtrates were subjected to a rotary evaporator to remove the entire ethanol and finally the crude extract was formed and then stored at −20°C until further analysis.

2.4 Qualitative Phytochemical Analysis:

Seaweeds were assessed for the existence of the phytochemical analysis by using the following standard methods 15

2.4.1. Test for Terpenoids

1ml of sample extract, one bit of Tin, and continued thionyl chloride was eroded to a test tube and the pink color change indicated the presence of Terpenoid content.

2.4.2. Test for Steroids:

1 ml of chloroform and an equal volume of concentrated H2SO4 were added with the 5

ml aqueous plant crude extract. The color change from bluish-red to cherry indicates the presence of steroids

2.4.3. Test for Coumarin:

1ml of extract and 1mlof 10% NaOH were added to a test tube and the white precipitation showed the presence of the coumarin content.

2.4.4. Test for Tannins:

1 ml of lead acetate was added to the 1 ml of aqueous extract. White Precipitate formation showed the presence of tannins.

2.4.5. Test for Saponins:

5 ml of distilled water was mixed with 1 ml of aqueous crude plant extract in a test tube and it was mixed vigorously. Copius Lather Formation showed the presence of Saponins.

2.4.6. Test for Anthraquinones.

1 ml of seaweed extract was added to 1 ml of aqueous ammonia solution and pink, violet, or red color indicated the presence of anthraquinones in the ammonia phase.

2.4.7. Test for Proteins:

Xanthoprotein test was used for the protein analysis. 1ml extract and 1 ml con. Nitric acid (HNO3) was added to a test tube and boiled for a few minutes after that this setup was allowed to cool at room temperature then 20% NaOH was added to this. The appearance of orange color indicated the presence of Protein.

2.4.8. Test for Carbohydrates:

For carbohydrate analysis, Fehling's test was used. In this method, Benedict's solution was added to the seaweed extract and continued to heat for 5 minutes in a water bath. Change of color into green or yellow or red color indicated the carbohydrates.

2.4.9. Test for Glycosides

We added 2 ml concentrated H2SO4 to the whole aqueous plant crude extract and a few drops of Anthrone were added to this solution. A Green color paste formed which indicated the presence of the steroidal aglycone part of the glycoside.

2.4.10. Test for Catechins:

1ml of sample and a few drops of Ehrlich reagent and a few drops of Con.HCl was added to a test tube. The appearance of pink color indicated the presence of Catechins.

2.4.11. Test for Fixed Oil:

1ml of sample extract was placed on Whatman filter paper. The appearance of a grease spot indicates the presence of fixed oil.

2.4.12. Test for Flavonoid

1 ml of sample extract and 1-2 magnesium turnings were added and 1-2 drops of concentrated HCL were added to this solution. The appearance of red color indicated the presence of flavonoids

2.4.13. Test for Quinones:

1ml of sample extract and 1ml con. sulphuric acid was added to a test tube and is added. The appearance of red color indicated the presence of Quinones

3. RESULTS AND DISCUSSIO

Many studies identified the health benefits of Phytochemicals. Researchers have found that Phytochemicals have the potential to stimulate the immune system, prevent toxic substances in the diet from becoming carcinogenic, reduce inflammation, prevent DNA damage, and aid DNA repair. This study aimed to identify the effect of different drying methods on the phytochemical property of the seaweed extracts. Roohinejad et al.,2017 studied seaweeds as rich sources of sustainable food products and beverages. The seaweed comprises chemical additives and that is for pigment formation(astaxanthin) and also to initiate hydrocolloid properties (carrageenan, agar, and alginate) widely used as food in Asian countries (Holdt & Kraan 2018)

3.1. Phytochemical analysis of Seaweed extracts dried by different methods

3.1.1. Phytochemical analysis of *Centroceras clavulatum* extract dried by different methods

The Preliminary phytochemical analysis conducted on the differently dried extract of *Centroceras clavulatum* revealed the presence of chemicals like alkaloids, saponins, terpenoids, tannins, Flavonoids, Quinones, Anthraquinones, Glycoside Catechins and steroids which are known to exhibit medicinal as well as physiological activities. It is also reported the presence of such Phytochemicals varied based on the different drying methods. Particularly, Phytochemicals like Flavonoids and Coumarin are available only in two drying methods. In this flavonoid was available the e the in shade dry method. Quinone is obtained only by the Hot air oven (80°C) drying method. Phytochemical analysis of *Centroceras clavulatum* extract dried by different methods is given in table 3.1.1.

3.1.2. Phytochemical analysis of *Stoechospermum marginatum* extract dried by different methods

The presence of 15 Phytochemicals was tested in this study and only 14 Phytochemicals were found in *Stoechospermum marginatum*. Flavonoid was not available in the Stoechospermum *marginatum* extract. 7 Phytochemicals are completely present in all drying methods Anthraquinone was obtained by Shade dry and Hot air oven (60°C) methods and Saponins were available only in Hot air oven drying methods. Phytochemical analysis of *Centroceras clavulatum* extract dried by different methods is given in table 3.1.2.

3.1.3. Phytochemical analysis of *Padina gymnosperm* extract dried by different methods

Results clearly describe that Out of 15 Phytochemicals 6 Phytochemicals are completely present in all drying methods. Terpenoids were not available in *Padina gymnosperm* extract. Quinones and Catechins were obtained by two methods only but both were present in the extract of Shade dry method. Coumarin was absent only in the Sun-dried method and Saponins were lost only the in 80°C and Microwave oven drying methods. Phytochemical analysis of *gymnosperm* extract dried by different methods is given in table 3.1.3.

3.1.4. Phytochemical analysis of *Ulva Lactuca* extracts dried by different methods

In *Ulva Lactuca,* a maximum of 8 Phytochemicals were obtained by all drying methods which means these 8 Phytochemicals didn't show any impact of drying methods. Terpenoids were absent only in a Hot air oven at a high temperature(80°C) but surprisingly saponins were as available only in a Hot air oven at a temperature (of 80°of C). Only the in-microwave oven drying method Phenol was absent. Phytochemical analysis of *Ulva Lactuca* extract dried by different methods is given in table 3.1.4.

3.1.5. Phytochemical analysis of *Hypnea paranoia* extract dried by different methods

Results clearly describe that 7 Phytochemicals are completely present in all drying methods in *Hypnea pannosa*. Alkaloids and Terpenoids were only absent in a Hot air oven heat temperature (80°C). Tannins were absent t the n Hot air oven high temperature (80°C) drying method and Microwave oven method. Flavonoids were absent in the Hot air oven high temperature (80°C) drying method and the Sun-dried method. On the other hand, Saponins were available only in High temperature (80°C) oven drying method. Phytochemical analysis of *Padina gymnosperm* extract dried by different methods is given in table 3.1.5.

Table 3.1.1

Phytochemical analysis of *Centroceras clavulatum* extract dried by different methods is given in

Phytochemicals	**A1**	**A2**	**A3**	**A4**	**A5**
Alkaloids	_	+	+	+	+
Terpenoids	+	+	+	+	+
Steroids	+	+	+	+	+
Coumarin	+	_	_	+	_
Tannin	+	+	+	+	+
Saponins	+	+	+	+	+
Flavonoids	+	+	_	_	_
Quinones	_	_	_	+	_
Anthraquinones	+	+	+	_	_
phenols	+	+	+	_	+
Protein	+	+	+	+	_
Carbohydrate	+	+	+	+	+
Glycosides	+	+	+	+	_
Catechin	+	+	+	+	_
Fixed oil Test	_	+	+	+	+

(+) indicates the presence of compounds (-) indicates the presence of compounds

A – C.C

A1- Shade Drying

A2-Sun Drying

A3-Hot Air oven 60 ˚c

A4- Hot Air oven 80 ˚c
A5-Microwave oven

Table 3.1.2.

Phytochemical analysis of *Stoehospermum marginatum* extract dried by different methods

Phytochemicals	B1	B2	B3	B4	B5
Alkaloids	+	+	+	_	_-
Terpenoids	+	+	+	+	+
Steroids	+	+	+	+	+
Coumarin	+	+	+	+	+
Tannin	+	+	+	+	+
Saponins	__	_	+	+	_
Flavonoids	_	_	_	_	_
Quinones	+	+	+	+	+
Anthraquinones	+	_	+	_	_
Phenols	+	+	+	+	+
Protein	+	+	+	+	+
Carbohydrate	_	+	+	+	+
Glycosides	+	+	_	+	+
Catechin	_	+	+	_	+
Fixed oil Test	_	+	+	+	+

(+) indicates the presence of compounds (-) indicates the presence of compounds

B- S.M
B1- Shade Drying
B2-Sun Drying
B3-Hot Air oven 60 ˚c
B4- Hot Air oven 80 ˚c
B5-Microwave oven

Table 3.1.3.

Phytochemical analysis of *Padina gymnospora* extract dried by different methods

Phytochemicals	C1	C2	C3	C4	C5
Alkaloids	+	+	+	+	+
Terpenoids	_	_	_	_	_
Steroids	+	-	+	+	+
Coumarin	+	-	+	+	+
Tannin	+	+	+	+	+
Saponins	-	+	+	-	-
Flavonoids	+	+	+	-	-
Quinones	+	-	+	-	-
Anthraquinones	+	+	+	+	+
Phenols	+	-	-	+	+
Protein	+	+	+	+	+
Carbohydrate	+	-	-	+	+
Glycosides	+	+	+	+	+
Catechin	+	-	-	+	-
Fixed oil Test	+	+	+	+	+

(+) indicates the presence of compounds (-) indicates the presence of compounds

C1- Shade Drying
C2-Sun Drying
C3-Hot Air oven 60 ˚c
C4- Hot Air oven 80 ˚c
C5-Microwave oven

Table 3.1.4.

Phytochemical analysis of *Ulva Lactuca* extracts dried by different methods

Phytochemicals	D1	D2	D3	D4	D5
Alkaloids	+	+	+	+	+

Terpenoids	+	+	+	-	+
Steroids	-	+	+	+	-
Coumarin	+	+	+	+	+
Tannin	+	+	+	+	+
Saponins	-	-	-	+	-
Flavonoids	-	+	-	-	-
Quinones	-	+	+	+	+
Anthraquinones	-	+	+	+	-
Phenols	+	+	+	+	-
Protein	+	+	+	+	+
Carbohydrate	+	+	+	+	+
Glycosides	+	-	+	+	+
Catechin	+	+	+	+	-
Fixed oil Test	+	+	+	-	+

(+) indicates the presence of compounds (-) indicates the presence of the compound
D1- Shade Drying
D2-Sun Drying
D3-Hot Air oven 60 ˚c
D4- Hot Air oven 80 ˚c
D5-Microwave oven

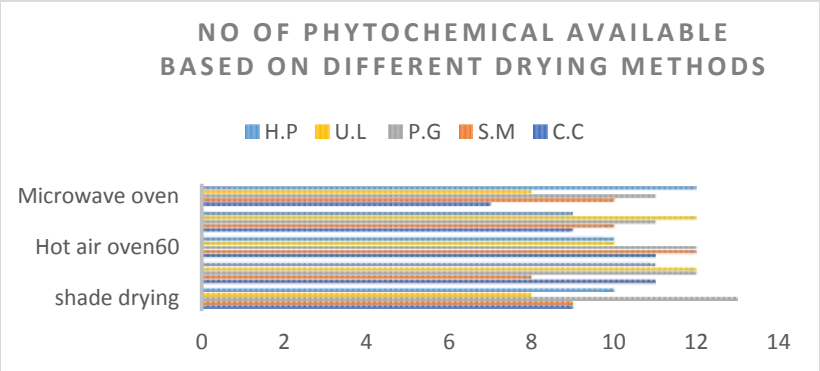
Table 3.1.5.

Phytochemical analysis of *Hypnea paranoia* extract dried by a different method

Phytochemicals	**E1**	**E2**	**E3**	**E4**	**E5**
Alkaloids	+	+	+	_	+
Terpenoids	+	+	+	_	+
Steroids	+	+	+	+	+
Coumarin	+	+	+	+	+
Tannin	+	+	+	-	_
Saponins	_	_	_	+	_
Flavonoids	+	_	+	_	+
Quinones	+	+	+	+	+
Anthraquinones	_	+	_	+	_
Phenols	+	+_	+	+	+
Protein	_	_	_	_	+
Carbohydrate	+	+	+	+	+
Glycosides	_	+	_	+	+
Catechin	+	+	+	+	+
Fixed oil Test	+	+	+	+	+

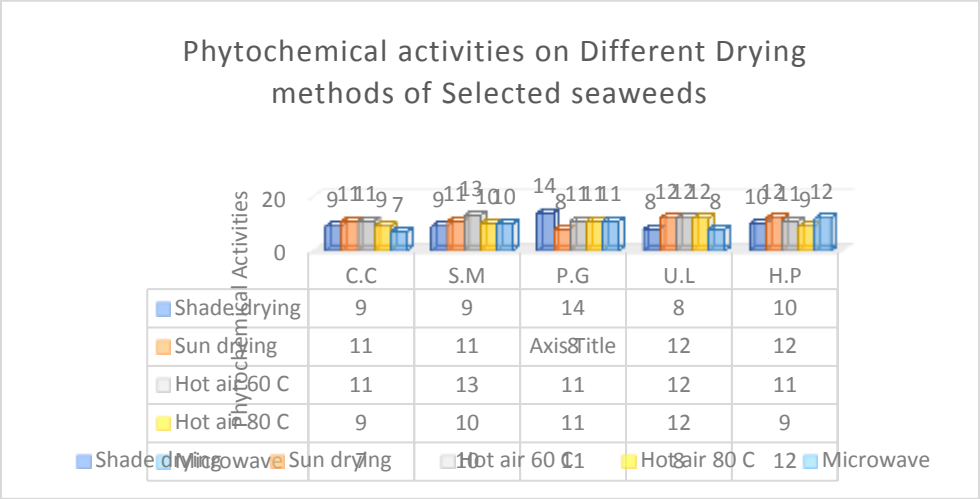
(+) indicates the presence of compounds (-) indicates the presence of compounds
E1- Shade Drying
E2-Sun Drying
E3-Hot Air oven 60 ˚c
E4- Hot Air oven 80 ˚c
E5-Microwave oven

Figure-1



C.C – Centeroceras clavulatum
S.M -- Stoechospermum marginatum
P.G –Padina gymnosporam
U.L.—Ulva lactuata
H.P.—Hypnea pannosa

Figure-2



Based on the procedure of the drying method required the efficient breakdown of cytological units which mainly the leads to release of phytochemicals during extraction by Cox et al., 2012.Figure -1. clearly describes that more in the shade drying method and Microwave oven method a high number of Phytochemicals in *Padina gymnospora.* Next to the Hot air oven60˚C and 80˚C dry methods, the Sun drying method holds a low number of Phytochemicals and the Microwave n drying method holds high several Phytochemicals next to the Hot air oven method (80°C) drying method Sun-dried method. In contrast to this Padina gymnosperm hold a high number of Phytochemical than thein y had shade dry method and holds a low number of Phytochemicals in the sun-dried method.

Variation of metabolites insists 3 brown seaweeds and recognized in chemical profile changes depend upon the different drying methods (Hamid et al.,2018). Though sun-dried methods hold a high number of Phytochemicals Tables 3.1.3 and 3.1.5 clearly show that in some cases Phytochemicals such as Flavonoids and Coumarin will not be available in the extracts prepared by the Sun-dried method but available in other drying methods. So, the Hot air oven (60°C) drying method is the best method for good phytochemical activity according to this study. Other notable aspects of this study are as follows. Steven et al.,2018 explained freeze-drying and convective air drying at 25,40,70˚C in Saccharina Bellissima that denote any effects when drying methods of some chemical components studied. A recent study, compared components of chemicals in oven-dried (25,40,60˚C) in Ulva Regina, Gracillaria SPS, and Fucus vesiculitis of fresh seaweed comprised that the extraction of polyphenols and its reaction influences drying treatment by Silva et al.,2019. *Centroceras clavulatum* holds a high number of Phytochemicals in the sun-dried method and oven-dried method (60°) C and it holds a minimum number of Phytochemicals in the microwave oven-dried method. In *Stecospermum marginatum*, the oven-dried (60)C drying method was very effective maximum number (12) of Phytochemicals were obtained in this method. Shade dried method is a less effective method for this species because the number of Phytochemicals obtained was only 09 out of 15. In *Padina* is shown by a shade-dried method which holds 13 Phytochemicals. On the other hand, a very low effect is shown by a sun-dried method which holds 8 Phytochemicals In *Ulva Lactuca*, three

methods (Sundry method, oven-dry (60°C), (and 80°) method) equally holds a high number of Phytochemicals (12). Shade dries and the Microwave oven method equally holds a low number of Phytochemicals (8).] In *Hypnea pannosa*, maximum (12) activity is exhibited in sun-dried and minimum activity (9 Phytochemicals) is exhibited in microwave oven dry method in oven dry (80) ˚C method. The best method is the Shade dry Method in Padina is good. Medium *in Ulva* and *Hypnea* and low activity of *Centromeres clavulatum* in this method. The above-said methods best concluded that the shade dry method& Minimum activity was observed in Sun dry Method. The medium activity was observed in the Microwave oven dry method.

4. CONCLUSION:

Seaweeds play a major role in society by contributing to global health. Bioactive compounds present in Seaweeds have been studied for more usage and better efficiency. Bioactive compounds such as phenols, proteins, flavonoids, alkaloids, etc. have positive effects on human health. Seaweeds are a good source of bioactive components and phytochemicals, both in terms of their profile and concentration. Various drying methods affect the bioactive components (phenolics, flavonoids, alkaloids, etc.) of Seaweeds differently. In this study, we investigated the impact of microwave, oven, shade, and sun-drying methods on the phenols, flavonoids, saponins, Steroids, Tannins, Coumarins, alkaloids, and protein content of five selected seaweeds. The results indicate that Shade drying and a Microwave oven are the best methods to maintain all the bioactive components in *seaweeds*, whereas the lowest levels were seen in sun-dried. However, microwave and shade methods have the potential in the area of drying sensitive material to better stability of bioactive components. From the above study, it can be concluded that the Shade drying and Microwave oven method should be used for effective study, and preparation of food supplements and drugs also.

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