

Volume 8, Issue 5(3), May 2019
**International Journal of Multidisciplinary
Educational Research**

**Published by
Sucharitha Publications
48-12-3/7, Flat No: 302, Alekya Residency
Srinagar, Visakhapatnam - 530 016
Andhra Pradesh - India
Email: victorphilosophy@gmail.com
Website: www.ijmer.in**

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IJMER, Journal of Multidisciplinary Educational Research, concentrates on critical and creative research in multidisciplinary traditions. This journal seeks to promote original research and cultivate a fruitful dialogue between old and new thought.

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ISSN : 2277 – 7881
Impact Factor :6.014 (2019)
Index Copernicus Value: 5.16



Editorial.....

It is heartening to note that our journal is able to sustain the enthusiasm and covering various facets of knowledge. It is our hope that IJMER would continue to live up to its fullest expectations savoring the thoughts of the intellectuals associated with its functioning .Our progress is steady and we are in a position now to receive evaluate and publish as many articles as we can. The response from the academicians and scholars is excellent and we are proud to acknowledge this stimulating aspect.

The writers with their rich research experience in the academic fields are contributing excellently and making IJMER march to progress as envisaged. The interdisciplinary topics bring in a spirit of immense participation enabling us to understand the relations in the growing competitive world. Our endeavour will be to keep IJMER as a perfect tool in making all its participants to work to unity with their thoughts and action.

The Editor thanks one and all for their input towards the growth of the **Knowledge Based Society**. All of us together are making continues efforts to make our predictions true in making IJMER, a Journal of Repute

Dr.K.Victor Babu
Editor-in-Chief

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TO EXPLORE THE IDEOPHONES AND IDEOPHONIC CLASSES IN OROMO: THE CASE STUDY OF ILU ABBA BOR, WEST WELLEGA AND WEST SHEWA

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Abstract

The aim of the study was to explore the ideophones and ideophonic classes in Oromo. The study was conducted in three Zones of Oromia Regional state: Ilu Abba Bor, West Wellega and West Shewa. The study was intended: to investigate different facets of ideophone and ideophonic classes in Oromo language. More specifically, to identify ideophones from other word classes of Afan Oromo, to investigate onomatopoeia ideophones found in Afan Oromo, to examine uses of the ideophones in relation to other word classes in Afan Oromo, to identify and classify ideophones in Afan Oromo. In order to achieve the intended objectives, qualitative research was adopted. 40 respondents were selected from three Zones using purposive sampling method. Two data gathering instruments namely: Interview and textual analysis were used to collect the necessary information. The finding shows ideophone is a word class which often has especial phonology often involving inherent reduplication and onomatopoeia, typically relating to manner, colour, sound, smell, action, state or intensity. It is clear that ideophones have a striking grammatical structure that sets them apart from other word classes in each language. In the establishment of word classes, it is usually formal and functional criteria that are used to tease words apart. We can thus safely conclude that ideophones are a cohesive class of words and that this cohesive class exists in Afan Oromo. Within this cohesive class, however, one may have subparts, and sub-categorization is indeed a feature of word classes in general.

Key words: Ideophone, Classes, Onomatopoeia

1. Introduction

1.1 Background of the Study

Ethiopia consists of a number of nations and nationalities or ethnic groups with different backgrounds and ways of life. Among those ethnic groups, the Oromo people are the largest ethnic group in Ethiopia and account for 50-60% of the population of the Ethiopian Empire (Tilahun, 1992).



The Oromo has vast and very rich culture and dialects fostered by the size of the population and large land areas. It has its own language which is called Afan Oromo or Oromo Language. Afan Oromo is a Cushitic language spoken in many parts of Ethiopia and Northern Kenya. It is considered one of the five most widely spoken languages among the approximately 1000 languages of Africa (Gragg, 1982). It is the third widely spoken languages in Africa surpassed only by Arabic and Hausa (Gadaa, 1988; Hordofa, 2001). The Oromo people primarily reside over a vast area of Ethiopia predominantly in Wallaga, Ilu Abba Bora, Jimma, Shawa, Arsi, Bale, Hararge, Wallo and Borana. Because of this, there are different dialects which are different from place to place in the region. Therefore, this study deals with ideophones and ideophonic classes of some selected zones in Oromia Regional State.

1.2 Statement of the problem

Several notable studies exist which investigate the ideophones of African languages. Studies also exist which underscore phonology, morphology, syntactic and semantic features of ideophones in Ethiopian languages in particular and Horn of Africa in general.

Different scholars have investigated different fields of linguistics on Afan Oromo in different times. However, none of them have tried to investigate ideophone and ideophonic classes of the language. Therefore, this research fundamentally attempted to investigate the nature of ideophones and their classes in Oromo community of some selected Zones.

1.3 Objectives of the Study

1.3.1. General Objective

This study presents ideophones in Afan Oromo on the bases of description approach of linguistics. Therefore, the general objective of this study is to investigate different facets of ideophone and ideophonic classes in Oromo language.

1.3.2. Specific Objectives

The present study is designed to achieve the following objectives:

- To identify ideophones from other word classes of Afan Oromo
- To investigate onomatopoeia ideophones found in Afan Oromo
- To examine uses of the ideophones in relation to other word classes in Afan Oromo
- To identify and classify ideophones in Afan Oromo

Research Questions

The study attempts to answer the following basic research questions:



- How to distinguish ideophones from other word classes of Afan Oromo?
- What onomatopoeia ideophones are found in Afan Oromo?
- What are significances of ideophones in Afan Oromo in relation to other word classes?
- What are the characteristics of ideophones and what makes a word qualified as ideophone?

1.4. Significance of the Study

The importance of the study could be multifold. From the phonological point of view, the study of ideophones of the selected language is useful in speech synthesis. Similarly, since this is almost the first work on ideophone of Oromo language, it can serve as a spring board for the researchers who are interested studying ideophones in the language. Furthermore, the study is valuable for the Oromo language speakers and linguists who are interested in knowing facts about other African languages.

1.5. Scope of the Study

To carry out ideophone and ideophonic classes, studies in all Ethiopian languages would definitely have been an ideal undertaking. With limited time and resources, this approach was not however an easy task to handle at individuals level. The study was therefore delimited to investigate ideophone and ideophonic classes of Afan Oromo of three zones in Oromia Regional State: Ilu Abba Bor, West Wellega and West Shewa.

2. Review Literature

2.1 The concept of Ideophone

The term has found its way into many linguistic texts, especially dictionaries and lexicons. Trask (1993: 131-132) defines an ideophone as “One of a grammatically distinct class of words, occurring in certain languages, which typically express either distinctive sounds or visually distinctive types of action.” According to Dixon (2010) ideophone is a word class which often has especial phonology often involving inherent reduplication and onomatopoeia, typically relating to manner, colour, sound, smell, action, state or intensity. Crystal (1997:189) on the other hand defines an ideophone as a “...term used in linguistics and phonetics for any vivid representation of an idea in sound, such as occurs through onomatopoeia.” Crystal goes on to specify that in Bantu linguistics, “it is the name of a particular word class containing sound symbolic words”. Indeed, in many other languages of Africa and other parts of the world, ideophones are often treated as belonging to a specific word class (Bodomo (2000) for Dagaare, Kulemeke (1997) for Chichewa, Newman (1968, 2000) for Hausa, etc.). However, there is considerable controversy as to whether they



constitute a coherent class or are indeed distributed across many word classes. Whether or not they belong to different word classes, the following general criteria are often attributed to ideophones.

2.2 Phonology/Morphology

Ideophones are said to form a phonologically distinct group from other words in the language. Though they employ the same phonological inventories as other words, they have distinct phonological properties or even processes with regards to other words in the individual language. These properties have to be identified for each language.

The morphology of the ideophone often displays more iconicity and sound-symbolism than other words in the language. In many African languages, they tend to be longer words to describe repetition or the intensity of an action or event they lexicalize. A salient feature that distinguishes ideophones from many other words is that there is hardly any affixation in the morphology of this group of words.

2.3 Syntax/Semantics

Ideophones cannot normally be syntactically modified whereas other words in the language can be modified. As will be shown for Afanoromoideophones do not usually enter into phrase structure constructions with other words like adjectives to form compound words and phrases.

Semantically, they are characterized by the lack of hyponymy, i.e., they cannot usually have hyponyms below them as one would have for nouns e.g. furniture: chairs, tables, beds.

2.4 Pragmatic Functions

There are often very large numbers of ideophones in spoken texts. These often express more spontaneous reactions of the speaker in the speech context as compared to similar expressions in written texts. A second pragmatic function of ideophones is one of phonic thematicity. Ideophone sarephonesthemes in function in the sense that they directly imitate sounds in nature. In other words, most, though not all, are onomatopoeic in nature, such as imitating the cock's crow, e.g. konkoliirikoo (Dagaare), kokrokoo (Akan), cookoo (English), cock-a-doodle-do(American English).

Ideophones are generally known to be marked words that vividly depict sensory events. They normally express the personal feelings or attitudes of the speakers. Doke (1935) defined ideophones as "A vivid representation of idea in sound, qualitative or adverb in respect to manner, colour, sounds, actions, smell, state of an affairs or intensity". By this token, it is clear that



ideophones form a distinct word class in human language as they affect attitude and emotion. Welmer, (1973) described ideophones as a set of words in language which contain sounds and sound sequence, tonal structure and phonological behaviour as ideophones. In a way, ideophone and sound could be seen as proof of their users' sensitive feeling for language, a deep sensitive attachment to sounds and their power of vivid representation. Ideophones are marked out from other words in many ways, for instance, on the basis of phonofactors, word structures, expressive morphology, syntactic aloofness, prosodic foregrounding etc.

Ideophones are attested in virtually all languages of the world. Nevertheless, languages differ significantly in the extent to which they make use of them. For this reason, some linguists do not think it is significant to talk about a universal class of ideophones. They maintain that the concept makes sense only within the context of an individual language.

However, in Afan Oromo ideophones, unlike many other languages, there seems to be no use of sound not found in the rest of the languages. Apart from the number and types of syllables, the only phonetic peculiarity found in ideophones is the permissible of non-final nasalized vowel. They are distinguished by their morphemes and word structure. It has been observed that ideophones are frequently phonologically anomalous, that is, they may contain phonemes not found in other types of words or unique sequence of phonemes and they may be aberrant in respect to the rule of tone that applies to them.

Samarin 1971 submits that most ideophones do not simulate the sounds they represent. The iconicity presents in ideophones are variables and they forms part of arbitrariness on which non-ideophonic language can be located. At one end of this continuum is a totally arbitrary rotation between sound and meaning. Ideophone maintain "double articulatory", where sounds are combined meaninglessly to convey meanings. At the other end, the relation between sound and meaning is direct. Sound symbolism and onomatopoeia are representative members of this continuum (ideophones) midway along this continuum are processes describe by Woodbury 1987. Awobuluyi (2004) argues that ideophones belong to a class of adverbs. This implies that ideophones have much greater representation in human language. At this juncture, it is useful to spell out the characteristics or attributes of ideophones in human language. The following characteristics are often attributed to ideophones:

- Phonology/ Morphology- Ideophones are said to form phonological distinct group (a) from other words in human language. In other words, they have distinct phonological properties and processes with regards to other words in individual language. The morphology of ideophones often displays more iconicity and sound-symbolism than other words in language. In many African languages, they tend to be longer as a result of vowel lengthen and



consonant cluster. A salient feature that distinguishes ideophones from many other words is that there is hardly any affixation in the morphology of this group of words.

- Syntax/ semantics- The study of ideophones in many languages of the world reveals that ideophones cannot normally be syntactically modified whereas other words in language can be modified. In other words, ideophones do not usually enter into phrase structure construction with other words like adjective or noun to form compound words and phrases. Similarly, they have characterized by lack of hyponyms. They cannot have hyponyms below them as one would have for nouns. For example, furniture which has its hyponyms as chair, table, cabinet, bed cupboard etc.

- Semantics/ Pragmatic- Apart from their unique phonological, morphological and (c)syntactic features as noted above, ideophones, unlike comparable word classes such as adjectives and adverbs do not seem to have independent semantic feature as we are going to see from the glossary and transliteration in this paper. It is very hard, though not impossible, to pin them down and assign denotation or dictionary meaning to them.

Generally speaking, ideophones are vivid representation of an idea in sound. It is a word, often onomatopoeic which describes a predicate, qualificative or adverb in respect to manner, colour, sound, smell, action, state or intensity (Doke 1935:118)

The classification of ideophones remains under debate. They have been defined very broadly in different literatures as anything with a sound –symbolic element, in which case they are realized as all major parts of speech. For example, English verbs such as ‘gobble’ or ‘twinkle’ are sometimes treated as ideophones .this seems too broad a definition to be useful ,as a phonetic regularities apply across the lexicon .’Ideophones are depictions, that is, they are special in the way they signify their referents (Dingemans 2012).

3. Methodology of the Study

This part presents the research design, subjects of the study, the sampling technique, data gathering instruments, procedures of data collection and techniques of data analysis that are necessary for the realization of the study.

3.1 Research Design

This research is purely qualitative. Therefore, a descriptive research design of linguistics was employed with the assumption that this type of design is suitable to adequately address the objectives of the study specified in advance. Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. The quality of research into meanings and interpretive processes cannot be assured simply through following correct procedures. Yin (2011) forwards



different features of qualitative research. According to him, qualitative research involves studying the meaning of people's lives under real world conditions. Therefore, the events and ideas emerging from qualitative research can represent the meanings given to real-life events by the people who live them, not the values, preconceptions, or meanings held by researchers. Qualitative research covers contextual conditions, social, institutional, and environmental conditions within which people's lives take place.

3.2 Subjects of the study

The population of this study is the people of Oromo who speak Afan Oromo as native speakers and live in different zones of Oromia Regional state.

3.3 Sample size and Sampling techniques

In this Study, Purposive sampling technique was employed. The researchers purposefully selected 40 informants who are native speakers and share typical experience with regard to the research in focus. The reason for selecting purposive sampling method is in order to elicit the linguistic data that the researchers want to address. Hence, from both sexes, elders and younger members of the community were selected as informants. The main advantage of using purposive sampling method in this study is not to determine how the selective informants are or how the given experience is distributed in the community; instead it is to find individuals who can provide rich and varied insights into the problem. In addition to this, the researchers used simple random sampling method to select woredas of the selected zones.

3.4. Procedures of Data collection

To collect the necessary data, the following procedures were used: First, the researchers identified the key informants from different woredas of different zones who are native speakers of the language through culture and tourism office of the zones. Second, the researchers took informants through culture and tourism bureau of selected woredas.

3.5. Instruments of Data Collection

Using appropriate methods of data collection is absolutely necessary to meet the intended goal in doing research. Therefore, two research tools: Interview and textual analysis were used to gather relevant information for the study.

3.5.1 Interview

Interview is taken as one means of data collection instrument. Interview is favored for its relevance to the nature of the study and used as a main tool of data collection in this study. According to Donyei, (2007:18), interview is a natural



and socially acceptable way of collecting information that most people feel comfortable with and which can be used in verifying situations and in focusing on diverse topics to yield in-depth data. It is a powerful way of helping people to make explicit things that were otherwise implicit and to accumulate the facts perceptions, feelings and understandings (Arkey and Fright, 1999:135). In this study, therefore, it is preferred to gather unlimited facts. The researchers adopted the assumption that would provide the study with more relevant data to address the objectives set in advance.

In general, semi-structured and unstructured interview questions were used in the study. These open-ended questions are used to enable the respondents to give free response using their own terms to explain and qualify their responses. Semi-structured interviews was also be used with the purpose of generating information rich in data. Semi-structured interviews are used to give freedom for the interviewees to express their feelings, interests, understandings and even actions under investigation. In addition, it is used to control their ideas when they go out of the study focus and start to provide irrelevant data or information. The interview questions was prepared in English and translated into Afan Oromo.

3.5.2 Textual Analysis

Textual analysis is another tool to gather information for the study. It is an important research tool in its own right and is an invaluable part of most schemes of triangulation. A document may be: written document, a painting, a map, a photographs, video etc. Documents are unobtrusive and can be used without imposing on participants; they can be checked and re-checked for reliability. With regard to the texts, the researchers used to analyze any written, oral, recorded audio and videos. Rayner et.al (2004) describe ‘textual analysis’, which is the analytical method that is to be applied on documents, as one of the cornerstones of cultural studies; and defines as a process by which we can both reveal the inner workings of a text and identify its significance in terms of the wider social and cultural issues to which it relates. Textual analysis is sometimes called careful reading. Textual analysis is a method that communication researchers use to describe, interpret, and evaluate the characteristics of a recorded message (Frey, Botan, Friedman, & Kreps, 1991 Cited in Iorio, 2004).

3.6. Data analysis and interpretation

The data gathered will be interpreted and glossed. The source language was written in Latin script or Qube and glossed in English. The translation was also be given place in order to avoid cumbersome signs and to create clarity to our readers. Finally, on the basis of the description, interpretation and conclusion about ideophones and ideophonic classes had been drawn.



4. Data Presentation and Analysis

It is helpful to have the knowledge of ideophones to understand once language which are expressed in its language. As it is mentioned in the review literature, ideophone is a part of language which is used to transfer message in different ways. The Oromo society uses different ideophones in different occasions to communicate different messages. For example, ideophones used during manner, taste and smell have different communicative functions. Therefore, in this study, the focus is how the society communicates by using different forms of ideophones. These are: manner, taste, smell, process, iconic, body image ideophones in the language:

4.1 Manner Ideophones

1. ettoonibiddarraafoxfoxjedhe
'wat' stove-on IDEO PAST
wat on the stove bubbled
2. .indaaqqooqalam-t-eebatatti-ftu
hen slaughter-GEN-PAST -IDEO- GENDER-PERF.
'The slaughtered hen swung'
3. corcoribishaan-ii
IDEO.water-NOM
'Water exuded' or 'water trickling'

The above data show us the manner in which the given subjects behave. In (1) the babbling manner of the dish on the stove is best expressed by ideophones. It gives a colorful image of the manner expressed to the native speakers. In (2) the manner a slaughtered cock can create an image of an animal shaking or having convulsions. The data in (3) shows the manner in which the water exuded is portrayed by an ideophone 'corcoror-'. Therefore, the above data show as that all of them are manner ideophones in Afaanoromo. Specifically, they may be variously as adjectives, ideophonic adverbs and –to lesser degree –ideophonic nouns and are structurally identical regardless of usage. The major patterns tend to be influenced by the morphological shape of source ideophones: ideophones roots comprised of a single syllable (which may or may not be reduplicated (like 3) in their stems) tend to be repeated three times whereas, those which are composed of two or more ideophones are usually repeated twice.

4.2. Iconic Ideophones

Sound symbolism is the term for a hypothesized systematic relationship between sound and meaning (Hinton, Nichols, and Ohala 1994).

Some animals especially birds and certain worms are named by their sounds and their shouts become their names. We can confirm this by the following data:

4. kakawwee-n bu'e



Lighting –NOM fall-PERF.

‘The thunder has fallen’

5. saan-i oote

Cow-NOM. IDEO.PAST

‘The cow shouted’

6. lootuu-n duu-t-e

Snake –NOM. Kill-F-PERF.

The snake has been killed

The data (4-5) show us that ideophonic name of the stated object and animal. In (4), the word ‘kakawwee’ is the name of the lightning which is taken from the shouts of the lightning while falling down to the ground. The data in (5) depicts us ‘‘oo’uu’’ is the name given for sounds which is made by cows when they are caught by hyena or any other animals. There are no syntactic indicators which separate nouns from other nouns nor are there any precise morphological criteria whereby they can be distinguished.

4.3 Ideophones and smell

There are obvious limited set for smell in Afaanoromo. For example, it is very small in number and it contains smells that are opposite in sense. The following data show us that couched in valanced terms. The two main terms are ‘urgaa’aa’ ‘good smell’ and ‘ajaa’aa’ ‘un pleasant’. The general term for smell is ‘foolii’ is fooliigaarii for ‘good smell’ and fooliibadaa or fooliigadhee for ‘bad smell’

7. fardidu’aa-n rorroqe

Horse dead-NOM. IDEO.TENSE

‘Dead horse becomes stinky’

It shows us stink smell, rotten fetid and bringing tears to one’s eyes

4.4 Ideophones and taste

The taste data consists of one solution for bitter. These are not targeted by this task, but additional elicitation does not contain a wide range of taste-related terms and most of them are not ideophonic.

8. qorichi-chi akkaebichaahadhaawa

medicine-DEF.as IDEO. bitter

‘The medicine tested very bitter’

As the data shows, the taste ideophone assaults the sense of a taste. The sensory assault involves unusual morphological pattern which means the ideophone is the lexical element unlike other ideophonic classes of the language.



4.5 Body image terms

Across the language there are a number of words that may be called ‘insultives’. These are variant adjectives that qualify specific body parts and are only used in insults or jocular remarks. They don’t necessarily resemble other ideophones morphologically in languages where this is marked and don’t show concord in languages where other adjectives do. All these words are invariant adjectives or in one case an exclamation and they have no obvious etymologies. Ideophones under these classes in this research syntactically occupy the place of predicate and serve as predicative adjectives.

9. miillaxofxoffaa’aa

Foot IDEO.

‘A foot became elephantiasised’

10. ijacofcoffoo or ciciimmoftuu

Eye IDEO.

‘An eye became teary, full of eye discharge and mucus’

11. gurbajoljola’aa

Boy IDEO

The boy walks inappropriately

This data best expresses the condition of the body that has been specified by the ideophones of the each data. In (9) the data best explains the foot which is severely affected by elephantiasis and which started to creak through which oozes a fluid. Similarly the data in (10) tells us the eye which became full of eye discharge and mucus. Correspondingly the data in (11) draws a picture of a boy who is big shapeless and fat.

4.6 Ideophones of process

Ideophones of this group are used to emphasize the completion of a process, and degree to which a process is repeated. These groups of ideophones are a conspicuous class of words in Afan Oromo. These are also marked phonologically through sheer word length (ideophones are on average longer than verbs and nouns), reduplicated or triplicated roots creating tactile sensation or images. They are also marked by expressive morphology and prosody; most of ideophones tokens in these particular data are performatively foregrounded, meaning they freely undergo various types of reduplication lengthening, and expressive intonation. In this class, we find deviant phonotactic patterns as follows:

12. buqqeetortoraa

Pumpkin IDEO.

‘Pumpkin rotten seriously’

13. ibiddibalaljedhe

fire IDEO. Be

‘bubbling fire’



The meanings of these ideophones are richly detailed, typically evoking the sensory event as the whole rather than describing just an aspect or abstraction. Morphologically, there are several constructions in which ideophones may occur. Their formation is by reduplicating their syllables-cvc-cvc-cvc. Descriptive narratives are frequently characterized by short, dynamic words which Jean Lydall calls expressive words. These words are essentially roots which have not assumed any specifically verbal, noun, or adjectival functions. Just as the general form of a noun does not specify a particular manifestation of an item, so an expressive word does not specify a particular aspect of state, but is an abstraction of what is common to all particular aspects i.e., what is common to the actions, and things being acted upon (Jean Lydall 2000).

4.7 Verbal Ideophones

Ideophones depict sensory imagery. Since the sensory imagery is often related to objects (as when talking about the appearance of a piece of cloth or the posture of a person), it is useful to survey the broader domain of manner denoting expressions in Afaan Oromo to see the place of ideophones in natural balance of the language. The properties of these constructions can be described in linguistic terms. But the significance of these constructions goes beyond the linguistic system: as they are used in everyday social interaction, they reflect and modify how a property is culturally construed or a person's posture is built up and how something behaves.

4.8 Nominal Insultatives

This class and many others are informal and used in pragmatics.

14. gommoolaa 'a person who seems jumping while walking'

15. gaanii 'a big and fat person who cannot walk'

The meanings of these ideophones are surprisingly consistent across speakers and rarely easily elicited without context. In addition, these simplistic ideophones are often the only means of expressing concepts such as buzzing, heartbeats, dripping, etc., which can be ordinary lexical items in more familiar languages.

Syntactically, ideophones pattern with adverbs in that they immediately precede the verbs as in the following.

A common distributional feature of ideophones is that they tend to occur as predicative adjectives in the following

a. warqecalaaqqisaa

Gold – IDEO

'Gold sparkles'

b. titiisniittiduude

Flies IDEO

'Flies invade'



5. Summary and Conclusions

In this paper, we have outlined the features of ideophones as attested in many languages of Africa and elsewhere. We have then focused on candidate data in Afanoromo. We have found that there are consistent similarities between attested ideophones and the so-called 'complex adjectives' in the language

5.1 Summary

In the formation of ideophones in the language, reduplication is saliently deployed. In both groups of words there is no independence of semantic denotation. These expressive phenomena are more recurrent in oral and non-formal situations in both languages than in written and formal contexts.

5.2 Revisiting the Issues

It is clear that ideophones have a striking grammatical structure that sets them apart from other word classes in each language. In the establishment of word classes, it is usually formal and functional criteria that are used to tease words apart. We can thus safely conclude that ideophones are a cohesive class of words and that this cohesive class exists in Afan Oromo. Within this cohesive class, however, one may have subparts, and sub-categorization is indeed a feature of word classes in general. The relative distances between various word classes within a language may not be the same from language to language. The foregoing observation has consequences with regard to lexical categorization across languages. Surely, we can say that one can find word classes in each language, which is not a new thing to say, but that, more interestingly, word classes may not have the same taxonomy from language to language, and that indeed some word classes, as is the case with ideophones, are existent in some languages but not in others. The consequences, then, for formal syntactic representation mean, among others, that one has to contend with different phrasal categorizations with their attendant reflexes in syntactic analysis. The study has also addressed the fact that ideophones have a special expressive and dramaturgic function that other words may lack in any one language. This therefore means that the study of ideophones can indeed go beyond the realms of core linguistics to areas like literature, narrative strategies, indirection, and the expression of emotion with linguistic and semi-linguistic or dramaturgic resources such as ideophones. Ideophones seem to form an important element of verbal art and a study of these words could link one from linguistics to the realms of communication, cognition, and culture.

In general, this work presents ideophones and ideophonic classes in Afan Oromo. This ideophones are formed by duplicating or triplicating their syllables. For example, the following data which are taken from the above examples under chapter four:



Corcorcor	CVC-CVC-CVC
Foxfoxfox	CVC-CVC-CVC
Xofxofxof	CVC – CVC- CVC

In addition, there are no syntactic indicators which separate ideophonic classes from other nominal and verbal classes, nor are there any precise morphological criteria whereby they can be distinguished. The only means of distinguishing criteria is the context it appears. Both partial and full segmental reduplication are attested full reduplication is more common and easier to delimit and describe as discussed above.

For the following nouns as may be observed in other examples that may follow there seems to be a semantic link between an object and the onomatopoeic nouns. However there are some small group of words in language which does not follow such arbitrary property of language. The relationship between forms and meaning of this group of words can be to some extent explained above. They are known as icon. The term icon is usually used in contrast with the term 'symbol' to describe linguistic forms which have explicit/transparent motivation to their meaning or referent (Chang, 1993).

Clearly, ideophones have a striking grammatical structure that sets them apart from other word classes in the language. In the establishment of word classes it is usually these same formal and functional criteria that are used to tease words apart. We can thus safely conclude that ideophones are a cohesive class of words and that this cohesive class exists in each of Afan Oromo. Within this cohesive class, however, one may have subparts, and sub-categorization is indeed a feature of word classes in general. The relative distances between various word classes within a language may not be the same from language to language. The foregoing observation has consequences with regard to lexical categorization across languages. Surely, we can say that one can find word classes in each language, which is not a new thing to say, but that, more interestingly, word classes may not have the same taxonomy from language to language, and that indeed some word classes, as is the case with ideophones, are existent in some languages but not in others. Moreover, the constellation of word class relationships will necessarily differ from language to language. The consequences, then, for formal syntactic representation mean, among others, that one has to contend with different phrasal categorizations with their attendant reflexes in syntactic analysis. The study has also addressed the fact that ideophones have a special expressive and dramaturgic function that other words may lack in any one language. This therefore means that the study of ideophones can indeed go beyond the realms of core linguistics to areas like literature, narrative strategies, indirection, and the expression of emotion with linguistic and semi-linguistic or dramaturgic resources such as ideophones. Ideophones seem to



form an important element of verbal art and a study of these words could link one from linguistics to the realms of communication, cognition, and culture.

An 'Iconic' is a non arbitrary intentional sign-which means that the sign/form contains intrinsic resemblance to its referent. Examples of iconic which are phonetically motivated by natural sounds in Afan Oromo given below and these are not arbitrary. In other words these nouns are iconic nouns

'Lootuu' type of snake
'Kakawwee' lightning

'konkolaataa' car

As observed in the examples above, however, not all onomatopoeic nouns duplicate their stems.

The smell and test ideophones are limited in number and are categorized on to extremes. The fragrance and the reek are expressed asurgaa'aa/ ajaa'aa respectively.

Ideophones of process, where role of agent is foregrounded are the next categories which have been discussed under chapter four. Some of these ideophones reveals the manner in which the activity is done.

5.2. Conclusion

- In Afan Oromo it is difficult to decide the word class of the ideophones . It is highly contextual
- The onomatopoeic ideophones in Afan Oromo are iconic
- Ideophones are to express emotions rather than other words and it is also used to create mental image of an entity
- Manner ideophones in Afan Oromo are so many and these are used as Insultatives
- Ideophones that express smell are only for aroma and for stink
- So far the data concerned,tasteIdeophones is only limited for the bitter

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WOMAN AS AN ADMINISTRATOR: A STUDY OF GITA MEHTA'S RAJ

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Abstract:

Women play a very significant role in every society. From being a mother of a family, she extends her traits of sharing and caring to engage herself as a person to face odds and challenges in professional life. In India, women representing half of the population, have the capability in bringing about changes in every aspect of our social life. With decisive attributes many women have occupied leading positions in Indian Administration. Unlike our great grandmothers, most of the women are currently in administrative roles by igniting the message 'All power is within you, you can do anything you want'. Hence, this message has brought many exciting opportunities to women occupying influential political figures from time to time. This is true when we see one is 'the first woman' or the only woman 'in a particular role.' With reference to the Indian political history we witness the brilliance of women in politics, time and again. Their proposals and political traits have been appreciated and criticized by many. However, their contribution to the development of the country cannot be disregarded. The dynamic Indian women politician like Indira Gandhi, the first Indian woman Prime Minister, Sarojini Naidu the first woman Governor, the first woman President of India Pratibha Patil, and at present Sushma Raj the second Indian woman to hold the position as Union Minister Of External Affairs, Nirmala Sitaraman the first woman to hold the position as the Defense Minister and so on. This paper aims at studying Gita Mehta's first novel Raj which focuses on the transformation of the protagonist Jaya who shuns her identity as an Indian Princess and struggles to find a 'new' place and a 'new' identity as a woman politician in the Democratic India. The character Jaya represents the class of princes who turn into politicians after India got independence. Her character resembles the present influential politicians like Maharani Gayatri Devi, former M.P., Smt. Vasundhara Raje the present Chief Minister of Rajasthan State. Chhavi Rajawat the first and the youngest Indian village Sarpanch and so on.

Key Words: Princes, History, Transformation, Identity



Woman as an Administrator: A Study of Gita Mehta's Raj

*Walk, and arise your fist affirm your decision to be free
don't walk three yards behind. It's your place by right Mother,
woman! The Revolution is you. - Indira Kulkshreshtha*

Literature has highlighted the women space and her participation in ruling nations, involvement in nationalist movement being pushed into the domestic household space, and finally their resurgence as super-women today. Women have been persistently accentuating their identity and their existence since the ages. Today, there is no arena, which remained unconquered by Indian women. Whether it is politics, sports, entertainment, literature, technology and almost everywhere we can hear applauses for her. The postcolonial fiction besides raising voice against atrocities and humiliation women face in the hierarchical society, highlighting the scope for development, the need to fight for their rightful place in the society and walk towards upliftment. The current novel Raj by Gita Mehta focuses on the transformation of the protagonist Jaya who shuns her identity as an Indian Princess and struggles to find a 'new' place and a 'new' identity as a woman politician in the Democratic India. Her life stands as an example that the humiliations and the disillusionments are the same either to peasants or princes in the Indian patriarchal society. However, Jaya sheds her passivity and accentuates herself as a leader and thus justifies her name Jaya as 'victory'.

In our society, at the one end, there are trends of modernization, westernization, and urbanization and at the other, there are traditions, conflicting values, gender stereotype, and differing levels of empowerment. However, the changed social milieu along with the new wave of modernization has altered their roles and relationship and provided women with new avenues to express and assert themselves. At present, the law grants the right or equal status in the social, cultural, economic and political fields which resulted in emancipation of women from the bondage of dust to the top position. Both positive and negative trends motivate women to emerge out of the homes. Now, women are assuming different roles besides the role within their homes. They have excelled in each and every field from social work to visiting space station. With decisive attributes many women have occupied leading positions in Indian Administration. Unlike our great grandmothers, most of the women are currently in administrative roles by igniting the message 'All power is within you, you can do anything you want'. Hence, this message has brought many exciting opportunities to women occupying influential positions from time to time. This is true when we see one is 'the first woman' or the only woman 'in a particular role'. There are many women in our country playing successful and leading roles in administration. The women with their physical manifestation of willpower,



grace, hard work and extraordinary brilliance are raising the bar and breaking the untouched barriers. These women have made India shine on a global platform. In the words of eminent poet, Ravindra Nath Tagore, women have important place in society: “Woman is the builder and molder of Nation's density- Though delicate and soft as a lily, she has a heart, stronger than of man-she is the supreme inspiration for man's onward march, an embodiment of love, pity and compassion.”(1)(Neeta, Vedic Path, P.157.)

The top Indian woman playing key roles in administration are for instance, Naina Lal Kidwai, the Group Chairman and Country Head, HSBC India, Chanda Kochhar, CEO & MD, ICICI Bank, Preetha Reddy, Managing Director, Apollo Hospitals, Vinita Bali, Managing Director, Britannia Group, Agatha Sangma, Union Minister of State for Rural Development, Kiran Bedi, the first woman IPS officer and the current Lieutenant Governor of Puucherry, and so on. With reference to the Indian political history we witness the brilliance of women in politics, time and again. Their proposals and political traits have been appreciated and criticized by many. However, their contribution to the development of the country cannot be disregarded. The dynamic Indian women politician like Indira Gandhi, the first Indian woman Prime Minister, Sarojini Naidu the first woman Governor, the first woman President of India Pratibha Patil, and at present Sushma Raj the second Indian woman to hold the position as Union Minister Of External Affairs, Nirmala Sitaraman the first woman to hold the position as the Defense Minister and so on. The character Jaya in the current novel Raj, represents the class of princes who turn into politicians after India got independence. Her character resembles the present influential politicians like Maharani Gayatri Devi, former M.P., Smt. Vasundhara Raje the present Chief Minister of Rajasthan State. Chhavi Rajawat the first and the youngest Indian village Sarpanch and so on.

The Indian history is bejeweled with tales of princes and the princess and their flamboyant lifestyles. The native princes, who had ruled over a number of states within British India, were the true embodiment of India's rich culture, tradition, valour, pride and governance. However, the princes' life style, powers had come to an end after India got independence. It was during 1950 all princely states were compelled to merge either in Pakistan or in India. Merely 565 princely states were merged into the united India by accepting the privy purses given by the Indian government, which were also terminated during Mrs. Gandhi's government in 1971. The princes were left alienated in their own land having lost their identities as Maharajas and Maharanis, Nawabs, Begums, Nizams. After that their powers are being stripped away, some of them have managed to become powerful businessmen and politicians, others are struggling to stay afloat, having sold off their gems, jewels, entire fleets, etc., living a life as private citizens. Gita Mehta's first novel Raj (1989) delineates the changed



identities of the Indian princes and their disillusionment in the post independent era.

The novel *Raj* under the veil of historical events it represents a woman's – constant struggle to live with dignity. The novel revolves around the central character Jaya and her transformation from a mute observer to an active individual. Her struggle begins with her birth. It is a time of Indian renaissance. In her childhood, she learns the lesson from the Renaissance. She is educated and sophisticated. However, she is like an ordinary woman has faced many problems with her husband and never be treated as a genuine life partner by her husband. She struggles very hard to protect her land and her powers as a regent. She loses her husband and her son. But she is not disappointed. At last, she sets her identity as a 'new' woman in the 'New India'. As Usha Bande observes:

Gita Mehta weaves the story of Jaya, the princess of Balmer and Maharani of Sirpur. It is intricately interwoven with the political events but it has the tears and romance of a woman's existence in India which saves the work from being a mere record of the all-too-well-known history of our freedom struggle, or a racy account of the grandeur and frivolity of the exorbitant life-style of the princess. (Bande 239)

Gita Mehta's *Raj* reflects a crucial period in the Indian history comprising Imperial British India and Royal India under the Princes. *Raj* opens the year 1897 with the birth of Tikka, the brother of Jaya and concludes in 1950, the end of an epoch when India attained freedom and the princely states merged with the Union. It is a clear historical episode that follows the progression of a young woman born into the Indian nobility under the British Raj.

The plot of the novel reveals to us the development of the character Jaya Devi who has been thrown into the fray by a relentless fate that takes away her father, brother, husband, and son. Jaya Devi, the heroine of the novel, is an intelligent, beautiful and compassionate daughter of Jai Singh, the Maharaja of Balmer state. Jaya plays the roles of both a mute observer and an active participant. As an observer, she has seen the lives of her father, brother, and husband who had fallen prey to the circumstances and were crushed in the double game of the British. As an active member, she withstands against the indissoluble realities and adversaries. She does not lose her courage after her husband's death and acts as Regent to her son. She accepts the changes that came with the changing times.

The novel has been structurally divided into four books in which the phases of Jaya's life is revealed with a historic flavour. The four chapters are "Balmer", "Sirpur", "Maharani", "Regent", all these give us the information about her varied experiences in her life. The novel comprises of an epilogue and aftermath along with these four chapters. The first book reveals Jaya's childhood,



the death of her brother and her father that led to her marriage with Dowagar Maharani's grandson Pratap Singh. The second book picturises her brother-in-law Maharaja Victor's suicide and her accession to throne as a Maharani. The third book portrays her personal and public life with her husband, birth of her son Arjun and death of her husband. The last book deals with her holding the charge as a Regent to her son, the Second World War, her son's death and the Indian independence merging of princely states. The novel ends with her resolution to participate in the general elections.

The novel opens with the scenario of the Balmer state and Raja Jai Singh is the ruler of the state. The land is called an abode of death due to deserts, frequent famines, and droughts. He is blessed with a son Tikka and a daughter Jaya the heroine of the novel. He is compassionate and cares for his subjects and as a reformist asks his wife to come out of the purdah system. He brings up both his son and his daughter equally in all respects. The influence of western ideology to bring up both his children at equal level is clearly seen in the very opening lines of the novel, "On a cold January morning when Jaya was five years old, her father insisted she accompany him into the jungle. The Maharani objected. The Maharajah overruled her" (Mehta 1)

Maharani insists that Jaya should be brought up with traditional manners and as true Rajput woman in conservative family traditions and customs. That's how Raja Jai Singh arranges an English tutor Captain Osborne for Tikka to teach him the western education. At the same time, he arranges Mrs. Roy an Indian nationalist, for Jaya. It is with her Jaya has come to know about the national movement and gets a chance to meet the influential national leaders of the nation.

Jaya has been taught the customs and traditions of the Rajputs since her childhood. She was filled with valour and courage as being a princess with the family motto: "A man cannot govern unless he confronts his own fears." (Mehta 5) Along with her brother Tikka, Jaya has been exposed to wild animals, taught to kill tigers, stick wild boar, and play polo, tent-pegging, and cricket. She is also taught Rajniti, the philosophy of monarchy according to the four principles of the Arthashastra: saam - serve the people; daan-provide for their welfare; dand - be even-handed in punishing injustice; and bhed - maintain secrecy to preserve the kingdom. On the other hand Maharani who is reluctant to change and taken a vow to bring up Jaya in the ways of her processors. Maharani thinks that alone could protect the child from the harsh, changing world beyond the zenana walls. Zenana is a palace for the women of the state where eunuchs and concubines i.e. mistress of the princes live.

At the very beginning of the novel, Jaya is a meek and timid girl who has been influenced by her father, mother, Mrs. Roy and also by Kakubai on one side and the other by the sequence of actions that took place during the period. She does not know what to follow and what is right for her. With her mother and the



concubine's guidance, she has learned the qualities of being a woman who is meant for pleasing their husbands and for bearing children to grow their clan. Jaya has learned woman liberation ideas of celebrating the idea of individualism from Mrs. Roy. Mrs. Roy teaches Jaya to upgrade her personality and urges Jaya to see life out of the zenana wall. She encourages Jaya to learn English and French to get exposed to what is happening outside the palace. She instigates Jaya's mind with nationalism and the ideology of the nationalists of India.

Tikka, the brother of Jaya goes to London for further education when the World War I breaks out. He joins the Sirpur regiment and participates in the war when he is only seventeen years old. Unfortunately Tikka dies in the World War, which causes ill health to Jai Singh and he dies or may have been poisoned by his cousin, Raja Man Singh. Jaya's mother exiles herself and becomes a Sati Mata. Raja Man Singh takes this situation as an advantage and with the help of the British Raj occupies Balmar and makes his son John as the successor.

Raja Man Singh humiliates the Maharani and conspires not to have a place in the state both for Jaya and Maharani. He finalises Jaya's marriage with Prince Pratap Singh of Sirpur and she is married by proxy, the sword of prince Pratap that represents the groom, as he is in Europe at the time. He spends most of his time with his elder brother abroad fornicating with foreign whores. Jaya has spent most of the time in the company of Dowager Maharani and Maharaja Victor, Pratap's brother watching English movies during her husband's stay in London. Pratap returns to Sirpur after two years of their marriage. Under the influence of western culture, Pratap does not accept his wife as she is a native woman. His frequent visits to England and his inclination toward westernisation have driven him infatuated with an Anglo-Indian dancer, Esme Moore. He refuses to consummate the marriage because he finds his wife too "native" for his tastes. He considers all Indian women as "wild boars, bristling with coarse black hair". (Mehta 220)

A Parsi dowager, Lady Bapsy Modi, is inducted to teach Jaya how to deport herself as a westernised maharani. Her hair is cropped, nails lacquered; she is taught how to mix dry martinis and dance the tango. She redeems herself when the Prince of Wales visits Sirpur by scoring the winning goal in a polo match. Jaya knows the fact that Prince Pratap does not have any interest in marrying her and Pratap is forced to marry her. But then she tries to be obedient to her husband and waits for his acceptance as his wife. She spends futile nights longing for her husband's company. Pratap also understands that Jaya loves him very much but he is unable to come out of the clutches of Esme Moore. Jaya shares her inner feeling with Mrs. Roy and to Kuki-Bai. She cries and shares how horrible it is to bear the loneliness after marriage. She says how each night she waits for her husband in despair. The humiliation of the last five years has



exploded inside her as she flung herself into Kuki-bai's lap and sobbed and said, "Do you understand? I disgust him. He will not touch me!" (Mehta 228)

Arun Roy the local political leader takes Jaya's unhappy conjugal life as an advantage and tries to get a chance to seduce her. Jaya's loneliness has been slipped away with Mrs. Roy's company and she deeply consoles Jaya. Mrs. Roy boosts up Jaya's confidence with her words and inspiring lines of the nationalists. Mrs. Roy advises Jaya not to become like her husband by being subjugated to the British and by being antagonistic to their own people.

'Do not become like him or you will belong nowhere.'

'I warned you, Bai-sa. It takes courage to fight for your rights.' Read the words of our great poet Tagore: "Where the mind is without fear and the head is held high, to that dream of freedom let my people awake." Every Indian should learn those lines. (Mehta 263)

After seven years, their marriage is consummated when he is in a drunken state and Jaya gives birth to a male child, Arjun. However, Pratap does not harbour any sentiments and emotions and never tries to win Jaya's heart. Jaya as an Indian woman follows her husband's footsteps, accompanying him in his journeys to London. Each day of hers is packed with activities of meeting with nationalist leaders and as a charming hostess to arrange parties for the whites.

Gita Mehta, being an eminent novelist has possessed deep insight into the female psyche. Focusing on the marital relation she seeks to expose the tradition by which a woman is trained to play her subservient role in the family. Her novels reveal the man-made patriarchal traditions and uneasiness of the modern Indian woman in being a part of them. Gita Mehta uses this point of view of present social reality as it is experienced by women.

Jaya becomes the Maharani of Satpur after the death of her husband's brother Victor. Jaya knows that her husband's waywardness and his spendthrift nature would always be a threat to Sirpur.

So When Pratap is threatened by Esme Moore, Jaya takes the initiation to settle the matter on a condition that her husband appoints her Regent of Sirpur. Mehta has brought out courage and confidence in Jaya's voice in this following scene: "There is a price for my services, hukam' ... "I wish to be named Regent Maharani of Sirpur, in the event of anything happening to you, until Arjun is of an age to take the throne." (Mehta 375). The famous feminist Betty Friedan says in *The Feminine Mystique* that the main problem for women is not sex but identity which has always been prevented to them. She finally declares "for woman, as for man, the need for self-fulfillment autonomy self-realization, individuality, self-actualization is as important as the sexual need, with as serious consequences, when it is thwarted" (Friedan 282). From the above quotations, we can understand that, the woman of today no longer wants to be a Cinderella, she needs a change for her survival; she has to release herself from all kinds of



exclusion. Today, the suppressed female voice is articulated to a certain extent and the dignity of women is affirmed. She has a greater share of social responsibility and a greater readiness to author her own authority.

Jaya with the help of her well-wisher, Tiny Dungra settles the Esme Moore episode by offering enough money to Esme Moore to become an actress. Soon after that Pratap dies in a plane crash and Arjun is made the Maharajah of Sirpur, while Jaya remains as a guardian to the throne.

The British try to abdicate the land after the Maharaj Pratap died. During this challenging time, her childhood English friend James Osborne is appointed as British resident at Sirpur who helps her in all respects. In the meanwhile Mr. Arun Roy, becomes a popular nationalist, and begins to campaign for the coming elections and stands as Congress candidate from Sirpur constituency. During his stay at Sirpur palace, Jaya arranges a hunting trip in a forest where she submits herself to him but unfortunately, he betrays her. James Osborne comes to know about this and files a report to the authorities suggesting her removal.

In the meanwhile, Arjun is sent to London for education where he gets wounded when he participates in World War II. National movement reaches its peak, consequently the "Direct Action Day" holocaust was ordered by the Muslim League in Calcutta in 1946. A frenzied Hindu mob attacks the car in which Arjun travels along with the Prime Minister. Unfortunately, Arjun dies in the communal riot while trying to save the Prime Minister Sir Akbar. This is the biggest tragedy that ever happened in Jaya's Life. It has taken a long for her time to get reconciled with the mishap in her life.

However, a chain of tragedies struck her; Jaya did not drown herself in the quagmire of despair, frustration, and disillusionment. She endured all vicissitudes with an indomitable will. Being a Rajput princess she has the inbuilt valour and ability to rule the state. Maharani who meets Jaya after ten years of her exile instills hope in Jaya saying that 'True Sati' is not the one who puts an end to her life after the death of husband, but continues to live by withstanding against the hardships and ordeals.

Along with Jaya, Maharani also makes amendments in her life according to the changing circumstances. While reaching to the end of the novel Jaya realizes her duty as a leader and recollects Raj Guru's words and finally takes the decision to serve the people being one among them. She realizes the fact that she can't escape destiny and the words of the Raj Guru constantly rang into her ear: 'Your dharma is protection. Bai-sa. You cannot escape your destiny.'(Mehta 516)

Jaya tries all the means to protect her state both from the British and the nationalists. Jaya realizes that Arun Roy has betrayed. She thought he would protect Sirpur from the British accession. Jaya realises the fact that Arun Roy wants to become the leader of Sirpur by seducing her. She becomes more



confident and strong at Arun Roy's the betrayal and she stands boldly and decides to face the circumstances as they come. She takes the timely decision to join the election fray after India attained independence. It is a part of her deeper realization and conviction that the Indian rulers have forfeited their claims to rule. She thought of making her life meaningful in serving her people not as a Maharani, but only as one of them.

Jaya joins the democratic process by filling her nomination for general election. The election officer seems to repeat what Maharaja Jai Singh had said years back, when Jaya was an infant; 'If the name is auspicious, let's call her Jaya, victory' (Mehta 44). True to her name Jaya is an ultimate victor, who triumphantly surmounts all impediments. She dedicates her life to fulfill her role as the guardian of her people. Before performing her dharma, she must first win her own freedom then lead her kingdom through the treacherous change of history.

By the time the novel ends the Balmer princess stands out as a free, self-assertive and self-confident woman of free India. Thus, the novel does not depict Jaya's life as a totally dismal and hopeless struggle. It suggests "hope" and "change" for the better. The novel demonstrates that self-actualization, awareness, and self-direction skills can make a woman being assertive in protective her identity and silhouette a woman as an individual.

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ASSESSMENT OF THE KNOWLEDGE, ATTITUDE AND PRACTICES ON MATERNAL-FETAL RH INCOMPATIBILITY AMONG REPRODUCTIVE AGE WOMEN IN ILLU ABA BOR ZONE, SOUTHWESTERN ETHIOPIA

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Abstract

Rh disease is a type of hemolytic disease of newborn which determined by the type of Rh blood group of the mother. Therefore, this study was aimed to assess the Knowledge, Attitude and Practices on maternal-fetal Rh incompatibility among reproductive age women in Illu Aba Bor Zone. Cross sectional study method was employed from March-August 2017 G.C. Data was collected from 997 reproductive age women systematically selected for the study. Both descriptive statistics and logistic regression analysis were used to analyze data using SPSS version 20. The result findings showed that the level of knowledge, attitude, and practices of maternal-fetal Rh incompatibility of the reproductive age women was low 23.4%, 24% and 14.1% respectively. The regression result showed that the age and occupation of reproductive age women were significant associated with attitude towards maternal-fetal Rh incompatibility. There were Pearson correlation knowledge and attitude ($r=0.311$), knowledge and practice ($r=0.596$) and there was also correlation between attitude and practice ($r=0.208$). Knowledge, Attitude and Practice of the respondents about maternal-fetal Rh incompatibility were low. So that, information should be provided the reproductive age women to create awareness since it is highly role to prevent the overall problem of maternal-fetal Rh incompatibility.

Key words: Attitude, Knowledge, Practice, Reproductive age women, Rh-incompatibility

Introduction

Rh disease is a type of hemolytic disease of newborn which determined by the type of Rh blood group of the mother. The rhesus (Rh D) group system is essential in blood transfusion because the Rh D immune response in Rh D negative women is the primary etiology for hemolytic disease of the newborn. The identification of the Rh D antigen and its depiction is a basis of modern immune hematology. Rh D iso-immunization, a disease of genetic predisposition, has been a center of concern for obstetricians and hematologists for centuries. Now, there are choices for both prevention and management of this historically difficult obstetrics. The incidence of Rh D iso-immunization in the general population continues to be a fact of meaning for the



clinician. As this significantly contributes to morbidity and mortality in obstetric practice, Allo-immunization to Rh D is a main factor in prenatal mortality and morbidity, and results in the compromise of the affected women's obstetric career (Okekeet al., 2012).

A pregnant woman can brand IgG blood group antibodies if her fetus has a blood group antigen that she does not have. This can happen if some of the fetus' blood cells pass into the mother's blood circulation (e.g. a small fetomaternal hemorrhage at the period of childbirth or obstetric intervention), or sometimes after a therapeutic blood transfusion. This can cause Rh disease or other forms of hemolytic disease of the newborn (HDN) in the current pregnancy and/or subsequent pregnancies. If a pregnant woman is identified to have anti-D antibodies, the Rh blood type of a fetus can be tested by examination of fetal DNA in maternal plasma to measure the risk to the fetus of Rh disease (Daniels et al., 2006). One of the major advances of twentieth century medicine was to inhibit this disease by stopping the formation of Anti-D antibodies by D negative mothers with an inject able medication called Rh (D) immunoglobulin (Cummings, 2000).

Uses of Rhesus (Rh) D immunoglobulin for prevention of hemolytic disease of the fetus/newborn (HDFN), Rh alloimmunization remain a clinical challenge (Adiaset al., 2013). The associated disease in the pregnant patient's child was once a main contributor to perinatal morbidity and mortality. However, the common adoption of guidelines for the antenatal and postpartum use of Rh immune globulin in industrialized countries has resulted in a highly decrease in the frequency of this disease (Kenneth et al., 2012). It is still now causal to the neonatal morbidity and mortality in the world because of non-immunization, under-immunization, and false Rh typing in rare cases (Sadiaet al., 2011). The occurrence of Rh-negative phenotype is significantly lower among Africans than Caucasians; Rh allo-immunization remains a main factor responsible for perinatal morbidity in Sub-Saharan Africa and may result in the compromise of the woman's obstetric care due to the unaffordability of anti-D immunoglobulin (Adiaset al., 2013). Due to Rh disease affected pregnancies were saw the risk of 24 % neonatal death with Kernicterus, 13 % impaired, 11% still birth from the total birth and also the problems were most observed in Sub-Saharan Africa than the other part of World (Vinodet al., 2013). According to WHO, the incidence and complications due to Rh incompatibility vary in different parts of the world and the low incidence of rhesus incompatibility in various parts of Asia. The reproductive risk of Rh negative women in Africa is three times that of non-African women and this shows that it is a problem (Kio et al., 2010).

The complications of Rh factor can be treated with timely exchange via blood transfusions. In most countries in Sub Saharan Africa (SSA), like Ethiopia there are linked with the Rh-negative pregnancies and also very little is known about the extent of Knowledge, Attitude and Practices of reproductive age women toward Rh factor. There has been limited number of studies conducted in Ethiopia regarding Rh disease (Fekaduet al., 2014). In the previous research the Knowledge, Attitude and Practices towards Rh factors of the study respondents were showed gaps (Diriba and Alemayehu, 2015). This study is differing from other similar studies done in Rh incompatibility in terms target population and the level of study area coverage. Thus, it will be more wide-awake and motivate to prevent Rh disease. Thus, this study was assessed the knowledge, attitude



and practice of reproductive age women about maternal fetal Rh incompatibility in Illu Aba Bor Zone.

Materials and Methods

Description of the Study Area

The study was conducted in Oromia Regional State, Illu Aba Bor Zone which has located on 600 Km away from Addis Ababa in Southwest Ethiopia.

Study Design and Period

A cross sectional study was conducted from March, 2017 to August, 2017.

Source Population

All Women who live in five woreda's (Alge, Buree, Doreni, Mettu Rural and Yayo) of Illu Aba Bor Zone were source of study population.

Study Population

All Reproductive age women who live in five woreda's (Alge, Buree, Doreni, Mettu Rural and Yayo) of Illu Aba Bor Zone were the study population based on sampling size and inclusion and exclusion criteria.

Inclusion criteria and Exclusion Criteria

Women age less than 15 and greater than 45 years and patients who cannot speak was excluded

Sampling Techniques

Systematic random sampling technique was used to select woreda and selected kebele. Then we were used simple random sampling techniques to select households in each kebeles in order to select individuals for questionnaires' using simple random sampling.

Sample Size Determination

The total female population belonging to the target age group were selected from the last Census data form total sample kebeles; the required sample size was calculated form total sample kebeles to give 95% confidence level and α value (0.05) to the study. The proportionally allocate to each was assumed to be 50% to attain the maximum sample size, with a margin of error of 3% at 5% level of significance and by considering 10% non- response rate, the sample size was determined based on the following Cochran's formula (Cochrane, 2017).

$$n = \frac{z^2(p*q)}{d^2}$$

d^2

Where; n=Sample size

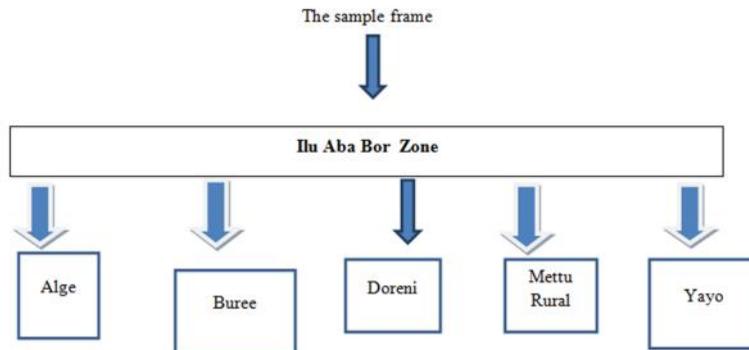
Z= confidence level of 95% (1.96)

P= Estimated proportion (0.5)

q= 1- P (0.5)

d= margin error (0.03)

Therefore, the calculated sample size was 997. Based on this one reproductive age woman sample would be select per house hold and the total sample size was propotionally allocated for each worda



Data Collection Methods

The data collection was used sources in order to assessment of Knowledge, Attitude and Practices of Maternal-fetal Rh incompatibility would be used self-administered questionnaire and interview with combined closed and open-ended questions of the women at reproductive age groups who are living at the areas by using Oromic Version instruments would be taken information from the respondents.

Data Processing and Analysis Techniques

In this study to analysis the data on the assessment of the knowledge, attitude and practices on maternal-fetal Rh incompatibility; each questionnaire would be checked for the filled of all data, edited, missed variables and then data was analyzed manually by using scientific calculator as well as using Statistical Package for the Social Sciences (SPSS) version 20 software program to provide frequencies and percentages for categorical variables and for numerical variables-correlation would be done to factors correlate with knowledge, attitude and practices of maternal-fetal Rh incompatibility and also used logistic regression and the results would be showed using tables, percent, figures and charts. Interviews would be recorded, transcribed, and translated into English. Then the data would be analyzed through an iterative process.

Variables in the study

Dependent variables are Level of knowledge, Level of attitude, and practices of Maternal-fetal Rh incompatibility. Independent Variables are age, occupation, marital status, educational status, residence, ethnicity, family size and educational status.

Result and Discussion

Result

Socio-Demographic Data

From the total of 997 respondents, 928(93.1%) of them were rural residence and the rest 69(6.9%) were urban residence, the majority 431(43.23%) of them were found between



age of 23-30 followed by 262(26.28%) with the age of 31-48. Concerning ethnicity, majority of the respondents 887 (88.97%) Oromo followed by Amhara which account 100(10.03%). Most of the respondents were married 893 (89.6%) for the rest 55 (5.3%), 34 (3.4%) and 17 (1.7%) of them were single, divorced and widowed respectively. As to religions the majority 411(41.2%) of them were Protestant, the rest 300(30.1%) and 286(28.7%) of them were Muslims and Orthodox respectively. On the subject of education 379(38.01%) of them were unable to read and write, 212(21.3%) of them were in elementary school, 187(18.76%) of them were able to read and write, the rest 109(10.9%), 107(10.73%) and 3(0.3%) were in Collage, High school and University and above respectively. On the subject of to their occupation the majority respondent 538 (53.96%) were farmers.

Multivariate Logistic regression

- A) Factors Associated with Knowledge:-In multivariate logistic regression of all the independent variables and also dependent factors (P=1.000) were not significantly associated with knowledge about maternal fetal Rh incompatibility (Table 1).

Table 1:Multivariate Logistic regression of knowledge towards Maternal-fetal Rh incompatibility with socio demographic characteristics of RAW in Illu Aba Bor Zone, 2017.

Table 1:Multivariate Logistic regression of knowledge towards Maternal-fetal Rh incompatibility with socio demographic characteristics of RAW in Illu Aba Bor Zone, 2017.

Variables/category		Multiple Covariate Results	
		AOR(95%CI)	P value
Age	15-22	0.000	1.000
	23-30	0.000	
	31-48	0.000	
	39-45	0.000	
Occupation	Farmer	0.501	1.000
	Merchant	0.248	
	House wife	0.863	
	Student	0.460	
	Unemployed	0.132	
	Government or Private employee	0.085	
	Daily laborer	0.055	
Time of heard	No I didn't	3.9925	1.000
	1-6 month	0.000	
	6-12 month	0.000	
	> 1 year	3.212	
Source of Information	Hadn't information	13.6	1.000
	Media	2.3054	
	Health extension workers	0.182	
	Health education from other health workers	0.118	
	School	0.645	
	Families	0.005	
know the difference between Rh positive and Rh negative blood types	Other	19.204	1.000
	Hadn't about it	3.607	
	Yes	0.285	
	No	1.096	



b) Factors Associated with Attitude

In multivariate logistic regression; the independent variables such residence ($p=.685$), religion ($p=.920$), marital status ($p=0.532$) were not significantly associated with attitude of the participants, while in multivariate logistic regression of age ($p=0.001$), occupation ($p=0.045$), ethnicity ($p=.031$), family size ($p=.002$), educational status ($p=0.000$) were significantly associated with attitude of the respondents and also for dependent factors ($P<0.05$) were significantly associated with attitude towards maternal fetal Rh incompatibility (Table 2).

Table 2: Multivariate Logistic regression of attitude towards Maternal-fetal Rh incompatibility with socio demographic characteristics of RAW in Illu Aba Bor Zone, 2017.

Variables/category		Multiple Covariate Results	
		AOR(95%CI)	P value
Age	15-22	1.354	0.001
	23-30	0.255	
	31-48	0.157	
	39-45	0.343	
Occupation	Farmer	7.510	0.045
	Merchant	0.000	
	House wife	0.000	
	Student	0.000	
	Unemployed	0.000	
	Government or Private employee	0.000	
	Daily laborer	0.000	
What will you do if you are one of the women with maternal Rh incompatibility factor?	I decide not to be pregnant	0.277	0.003
	I visit the doctor	0.594	
	I do nothing	3.953	
What will you do if you encountered the women with maternal Rh incompatibility factor?	I advise not to be pregnant	.000	.000
	I advise to visit the doctor	.000	
	I do nothing	.000	
	Other	.000	

c) Factors Associated with Practice

In multivariate logistic regression of all the independent variables and also dependent factors ($P=1.000$) were not significantly associated with practices about maternal fetal Rh incompatibility (Table 3).



Table 3: Multivariate Logistic regression of practice towards Maternal-fetal Rh incompatibility with socio demographic characteristics of RAW in Illu Aba Bor Zone, 2017.

Variables/category		Multiple Covariate Results	
		AOR(95%CI)	P value
Age	15-22	5.341	1.000
	23-30	0.412	
	31-48	0.000	
	39-45	0.119	
Occupation	Farmer	7.796	1.000
	Merchant	0.060	
	House wife	6.361	
	Student	5.74	
	Unemployed	1.119	
	Government or Private employee	6.37	
	Daily laborer	0.032	
After examined and checked your Rh blood type	Rh ⁺	20.31	1.000
	Rh ⁻	0.162	
	I don't know	0.000	
After examined and checked your husband Rh blood type	Rh ⁺	0.000	1.000
	Rh ⁻	0.000	
	I don't know	6.488	

Correlation between Knowledge, Attitude and Practice

Furthermore, the study assesses the correlation between knowledge, attitude, and practice scores of the study participants.

Table 4: The correlation between knowledge, attitude and practice.

		Knowledge on Maternal-fetal Rh incompatibility	Attitude on Maternal-fetal Rh incompatibility	Practice on Maternal-fetal Rh incompatibility
Knowledge on Maternal-fetal Rh incompatibility	Pearson Correlation Sig. (2-tailed)	1	.311** .000	.596* .000
Attitude on Maternal-fetal Rh incompatibility	Pearson Correlation Sig. (2-tailed)	.311** .000	1	.208 .000
Practice on Maternal-fetal Rh incompatibility	Pearson Correlation Sig. (2-tailed)	.596* .000	.208 .000	1

**Correlation is significant at the 0.001 level (two tailed)



The study assesses the correlation between knowledge, attitude, and practice scores of the study participants. Knowledge and attitude scores of the participants achieved significant and had fair positive correlation ($r = 0.311$; $P = 0.00$). Similarly, knowledge and practice scores of the participants had shown statistically significant positive correlation ($r = 0.596$; $P = 0.00$). The attitude and practice scores of the participants had also significant positive correlation ($r = 0.208$; $P = 0.00$) (table 4).

Discussion

Socio-Demographic Status

From the total of 997 respondents, 928(93.1%) of them were rural residence and the rest 69(6.9%) were urban residence, the majority 431(43.23%) of them were found between age of 23-30 followed by 262(26.28%) with the age of 31-48. Concerning ethnicity, majority of the respondents 887 (88.97%) Oromo followed by Amhara which account 100(10.03%). Most of the respondents were married 893 (89.6%) for the rest 55 (5.3%), 34 (3.4%) and 17 (1.7%) of them were single, divorced and widowed respectively. As to religions the majority 411(41.2%) of them were Protestant, the rest 300(30.1%) and 286(28.7%) of them were Muslims and Orthodox respectively. On the subject of education 379(38.01%) of them were unable to read and write, 212(21.3%) of them were in elementary school, 187(18.76%) of them were able to read and write, the rest 109(10.9%), 107(10.73%) and 3(0.3%) were in Collage, High school and University and above respectively. On the subject of to their occupation the majority respondent 538 (53.96%) were farmers.

Similar pattern of frequency percent was observed in other previous similar study regarding to ethnicity and religion; but in terms of marital status, it seem not to agree with the results obtained from Ambo university in Ethiopia where the percentage frequencies of 263 (87.4%) single marital status were high (Diriba and Alemayehu, 2015).

Knowledge

From the total of 997 respondent, 233(23.4%) of them were have awareness on maternal-fetal Rh incompatibility, 139(13.94%) of them respond that timely heard of maternal-fetal Rh incompatibility were above one year, rest of them, 50(5.02%) and 44(4.41%) responds that timely heard were in between 1-6 month and 6-12 month respectively. Concerning source of information from the total 997 respondents, 110(11.03%) of them were obtaining information's regarding maternal-fetal Rh incompatibility from health extension workers the rest got from other sources, health education from other health extension workers, school, media and families respectively others 764(76.63%) of them respond that they didn't have source of information about maternal-fetal Rh incompatibility. From the sources of information they get 121(12.1%) of them were obtained about prevention ofmaternal-fetal Rh incompatibility the rest 58(5.8%), 37(3.7%) and 5(0.5%) of them were obtaining medication of Rh disease, effect of Rh disease and others respectively. Regarding to knowing the person affect by Rh disease respond the majority 821(82.3%) of them didn't know the affected person and 171(17.21%) of them did know the affected person.



It has also been reported in other studies that there are poor knowledge about maternal fetal Rh incompatibility among females which was conducted in Korangi, Karachi in Pakistan and also Ambo University in Ethiopia (Sadiaet al., 2011; Diriba and Alemayehu, 2015).

Attitude

Among respondents, 239(24%) of them showed positive thought on the cause of maternal fetal Rh incompatibility; the 758(76%) the respondents had negative attitude towards of maternal fetal Rh incompatibility. Regarding to the feeling of when face Rh disease; sadness 460(46.1%), fear 307(30.8%), embarrassment 94(9.4%), other 63(6.3%), shame 52(5.2%) and surprise 21(2.1%), were the feeling of those respondents. It has also been reported in other study that there are majority of the respondents have bad attitude about maternal fetal Rh incompatibility among females and also sadness, fear and surprise have the major negative reaction towards those face Rh disease respectively which was conducted in Ambo University, Ethiopia (Diriba and Alemayehu, 2015).

Practice

Further assessment was done to determine the women's practices with respect to maternal-fetal Rh incompatibility. According to the results, most of the participants of the study have poor practices toward the Rh disease in the study area. As indicated above many of them 856(85.9%) did not know their Rh blood type and 939 (94.18%) did not check for their husband's blood type. It has also been reported in other studies that there are poor practices about maternal fetal Rh incompatibility which was conducted in Iraq at Najaf city and also Ambo University at Ethiopia (Shamilet al., 2013; Diriba and Alemayehu, 2015).

Conclusion and Recommendation

The present study showed that the level of knowledge, level of attitude and practices of the reproductive age women towards maternal fetal Rh incompatibility was low 23.4%, 24% and 14.1% respectively. The factors associated the respondents'; all the independent variables were not significantly associated knowledge, attitude, and practice of maternal fetal Rh incompatibility. But the age and occupation were significantly associated attitude maternal fetal Rh incompatibility. Special attention should be focused on improving respondents' knowledge, attitude, and practice about maternal fetal Rh incompatibility because the problem prevent by early diagnosis of Rh blood type. The stakeholders should increase the effort to create awareness about maternal fetal Rh incompatibility among reproductive age women through health extension workers. Although further investigation is need to measure the implementation way of prevention and medication of Rh disease in health care services by quantitative and qualitative study methods are recommended for researchers.

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ASSESSMENT AND UNDERSTANDING OF GUJJAR AND BAKERWAL WOMEN'S HEALTH IN JAMMU AND KASHMIR

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Abstract

The Gujjars and Bakerwals, the third largest ethnic group in Jammu and Kashmir after Kashmiri and Ladakhi, constitute more than 20 per cent population of the State. They are the state's most populous Scheduled Tribe having a population of more than 20 lakh as per the 2011 census and one fourth of them are living nomadic life. Out of the total nomadic Gujjar and Bakerwals, 66 percent population of nomad Gujjar-Bakerwals who fall under Scheduled Tribe groups in the state of Jammu & Kashmir are living Below Poverty Line, revealed a survey conducted by Tribal Research and Cultural Foundation (TRCF), a frontal organization working for the cause of Indian tribes. The Gujjar and Bakerwal women's health in Jammu and Kashmir is the worst, because of lack of education, lack of awareness about health programs and their way of living nomadic life. Like many other places Gujjar and Bakerwal women's position in Jammu and Kashmir has been central in the upbringing of children, grazing their goats and sheep's and managing domestic affairs

Introduction

Jammu & Kashmir State is one of the States of Indian Union. In the seventeenth century when the Mughal emperor Jahangir set his eyes on the valley of Kashmir. He said that if paradise is anywhere on the earth, it's here, while living in a houseboat on Dal Lake. "Gar firdaus, baruhezaminast, haminasto, haminasto, haminast". If there is ever a heaven on earth, it's here, it's here, and it's here. It is also the northern Muslim dominated state of India with population more than one crore as per Census figures (2011). The State has its own Constitution besides the Constitution of India and enjoys the special status under article 370. J&K is compounded by militancy and armed conflict, which have taken a heavy toll of life and public property besides throwing normal life out of gear.

Gujjars and Bakerwals in J&K

The Gujjars and Bakerwals, the third largest ethnic group in Jammu and Kashmir after Kashmiri and Ladakhi, constitute more than 20 per cent population of the State. The both groups of Gujjar community are without sufficient food, fodder



for their animals. They lack basic facilities like proper shelter, health, drinking water, and education.

The Gujjars and Bakerwals in the state are the poorest, living in sordid conditions, had no access to education as they are of migratory characters. There is need to formulate a sustainable poverty eradication programme for migratory tribes as they deserved special attention due to toughest lifestyle, lacking economic freedom and food security owing to low-income and deficiency of resources.

Material and Methods

The present study was conducted among Gujjar and Bakerwal women residing in Jammu and Kashmir. Both primary and secondary sources of data were used in the study. The data was taken from interviews conducted by researcher, the census of India, report from the health sector of Jammu and Kashmir, papers published in journals and National Human Development Report of India.

Women's Health Status in J& K:

Primary health care for women is a must as also ante-natal and post-natal care during pregnancy. There is no exception to the fact that the health status of a woman is determined by several factors, which include literacy, age at marriage, birth intervals, and nutritional status and after all, maternity care.

Against the backdrop of the above needs, National Policy on Health (1982) took a serious note of integrating the health services for women and children under the 20point programme wherein high priority was accorded to the promotion of family planning services. It emphasised a substantial augmentation and provision of primary health care facilities on universal basis. Maternity and Child Health (MCH) were integrated with family welfare programme. The extended programme of immunisation and Universal Immunisation Programmes were visualised as major aids to MCH for better child survival and safe motherhood. This programme was introduced in 1974 with the objective of reducing mortality and morbidity (which is 44 per thousand) in the state due to Diphtheria, Pertussis, and Tetanus.

Gujjar and Bakerwal Women

The tribal Gujjar and Bakerwal women of Jammu and Kashmir live in utter deprivation due to poverty, illiteracy, early marriage, nomadic way of life, superstitions, traditional neglect and lack of awareness about welfare schemes, mentioned by study conducted by Tribal Research and Cultural Foundation (TRCF). "The Gujjar and Bakerwal women are not aware of their rights and schemes launched by the government for their education, health and social uplift

as they live in far-flung and difficult areas and are nomads moving from one place to another.” The facilities offered to the women in this community are inadequate. “This can be understood from the fact that there are only two Government Hostels, one each in Jammu and Srinagar in the entire state for about 1.2 million Gujjar women.” The misery and woes of Gujjar and Bakerwal women of Jammu and Kashmir is surpass the treatment meted to any other women belonging to 12 different Scheduled tribe communities of the State. It is an established fact that the Gujjar-Bakerwal women are much more hardworking as compares to the tribal women belonging to Bot, Beda, Balti, Mon, Changpa, Garra, Purig, Shin Dard, Brokpa, Gaddi and Sippi Tribes of Jammu and Kashmir. Unfortunately Gujjar and Bakerwal women life is still passing through the darkness of superstition and illiteracy. Although they are quite aware of their duties, they contribute their best for the betterment of the TRIBAL society of State. But unaware of their rights, they continue to suffer as sacrificial goat at the hand of their family and society alike. Since half century back the women in the society, have become enlightened and have brought revolution in their life style to the extent that they have entered the field of Space Research but the unfortunate Gujjar Woman still lives a primitive life far away from the light of learning and devoid of modern facilities.



Gujjar And Bakerwalwomens Health

Health status is influenced by complex biological, social, and cultural factors that are highly interrelated. These factors affect men and women differently. Women's reproductive biology, combined with their lower socioeconomic status, result in women bearing the greater burden from unsafe sex-which includes both infections and the complications of unwanted pregnancy. Women's health of Gujjars and Bakerwals can be examined in terms of multiple indicators, which vary by geography, socioeconomic standing and culture. To adequately improve



the health of Gujjars and Bakerwals women in of Jammu and Kashmir multiple dimensions of wellbeing must be analyzed in relation to India's health averages and also in comparison to men in Jammu and Kashmir. Health is an important factor that contributes to human wellbeing and economic growth. Currently, women of Gujjars and Bakerwals face a multitude of health problems.

Determinants of Gujjar and Bakerwal Women's Health

Social Condition: - The Nomad Gujjar Women is undergoing thorough exploitations. They have to attend all the chores of the house hold from cooking to selling milk and helping their men at farming and cattle feeding. The dull life style and hard working from morning to late night makes her physically as well as mentally fatigued. Beside this the nomad Gujjar Women had been the victim of superstitions and despite her excessive work load. She is not getting due respect and position in the Tribal Society. In Bakerwal-Gujjars the Women and girls are supposed to tend their herds throughout day and walk long distances with their children and house hold luggage on their back as they are mostly nomads. They have to cook meals and do some washing on their temporary stops and again pack for the next destination. Ultimately they get no time even to think of their social status.

Economic factor

Poverty underlies the poor health status, and Gujjar and Bakerwal women represent a disproportionate share of the poor. Furthermore, the cultural and socioeconomic environment affects Gujjar and Bakerwal women's exposure to disease and injury, their diet, their access to and use of health services, and the manifestations and consequences of disease. Gujjar and Bakerwal Women belongs to poorest households have much higher fertility rates and which deteriorates their health conditions.

Malnutrition

Nutrition plays a major role in an individual's overall health; psychological and physical health status is often dramatically impacted by the presence of malnutrition. Gujjar and Bakerwal women don't get proper and balanced diet which leads them to anaemic in terms of iron deficiency. One of the main drivers of malnutrition is gender specific selection of the distribution of food resources. Maternal malnutrition has been associated with an increased risk of maternal mortality and also child birth defects.

Domestic violence

Domestic violence is a major problem among Gujjar and Bakerwal in J&K. Domestic violence-acts of physical, psychological, and sexual violence against



women-is found across the state. The effects of domestic violence go beyond the victim; generational and economic effects influence entire societies. The prevalence of domestic violence of Gujjars and Bakerwals in state is associated with the cultural norms of patriarchy, hierarchy, and multigenerational families. Patriarchal domination occurs when males use superior rights, privileges and power to create a social order that gives women and men differential gender roles. The resultant power structure leaves women as powerless targets of domestic violence. Men use domestic violence as a way of controlling behaviour.

Results And Discussion:

The Gujjar and Bakerwal women are not aware of their rights and schemes launched by the government for their education, health and social uplift as they live in farflung and difficult areas and are nomads moving from one place to another. Determinants of Gujjar and Bakerwal women's health, Social Condition, Biological determinant, Economic factor, Malnutrition, Domestic violence. Though the Central as well as the State Governments have launched a number of programmes and schemes for the betterment of rural as well as urban women like Indra Gandhi Matritva Sahyog Yojana, etc.

The observations for the signs and symptoms of anemia and malnutrition indicated that 90 percent of the subjects had pale cold skin, 89.5 percent had general weakness and 86.5 percent had yellow conjunctiva. Majority (90.5%) of the respondents showed clear cut presence of anemia having hemoglobin less than 10gm/dl. The results hold implications for professionals to introduce health programmes in order to improve the health of adolescent girls in particular. It further concluded that there is need for planning of health programme for Gujjar community. Since the group of the study was nomadic, it is important to have health services at their doorsteps. The planner need to educate and implement health services at their doorsteps, which could help them to lead healthy life. A focussed approach to develop awareness regarding their health in general is required so that preventive measures can be taken to protect the young population from major illnesses.

Gujjar and Bakerwal women must have access to comprehensive, affordable and quality health care. A holistic approach to women's health which includes both nutrition and health services with special attention to the needs of women and the girl at all stages of the life cycle is another priority of the government. The reduction of infant mortality and maternal mortality, which are sensitive indicators of human development, is a major concern. The government policy reiterates the national demographic goals for Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) set out in the National Population Policy 2000. Measures have been taken by the government to enable women to exercise



informed choices regarding their reproductive rights, vulnerability to sexual and health problems together with endemic, infectious and communicable diseases such as malaria, TB and water borne diseases as well as hypertension and cardio-pulmonary diseases. Government is also focused on to tackle the social, developmental and health consequences of HIV/AIDS and other sexually transmitted diseases with a gender perspective. Spread of education, compulsory registration of marriage and special programs like BSY and delaying the age of marriage so that by 2010 child marriages should be eliminated are other focus area of the government. In view of the high risk of malnutrition and disease that women face at all the three critical stages of life cycle viz., infancy and childhood, adolescent and reproductive phase, government is focused on meeting the nutritional needs of women and widespread use of nutrition education to address the issues of intra-household imbalances in nutrition and the special needs of pregnant and lactating women.

Conclusion

Improving Gujjar and Bakerwal women's health requires a strong and sustained commitment by governments and other stakeholders, a favorable policy environment, and well-targeted resources. Long-term improvements in education and awareness opportunities will play a positive role on the health of Gujjar and Bakerwal women and their families. In the short term, significant progress can be achieved by strengthening and expanding essential health services for Gujjar and Bakerwal women, improving policies, and promoting more positive attitudes and behavior towards Gujjar and Bakerwal women's health. Outreach, mobile clinics and community based services can be helpful. Clustering services for women and children at the same place and time often promotes positive interactions in health benefits and reduces Gujjar and Bakerwal women's time and travel costs, as well as costs of service delivery. Gujjar and Bakerwal women should be empowered to make more informed decisions and to act on them. For example, public education and counseling can increase access to information about selfcare and about when care is needed or where it is available. Even where health services are readily available and affordable, Gujjar and Bakerwal women may not use them if their quality is poor. Quality of care is a significant factor in a woman's decision to seek care, to give birth at a clinic instead of at home.

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VIEWING SOMATOTYPES THROUGH THE PERSPECTIVES OF CONSTITUTIONAL PSYCHOLOGY — AN ANALYTICAL STUDY

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Abstract

Originally, somatotyping could best be described as an art, skill, or technique that you had to “get good at.” This was discouraging to researchers. It was hard enough to put together an experiment that required nude photographs of the subjects, let alone dealing with the long learning-curve to be able to make accurate assessments that were basically educated guesses. Science is about replicating experiments and verifying the evidence collected. Since Sheldon and some of his close associates were the only ones skilled in these techniques, it is easy to see the danger of a conflict of interests. A somatotype that required interpretation might be weighted in favor of the desired experimental results. Sheldon was not ignorant of the need to make somatotyping completely objective. Throughout his career he experimented with various direct physical measurements of a subject in addition to the photographs. This paper has tried to throw light on somatotype personality from the perspectives of constitutional psychology

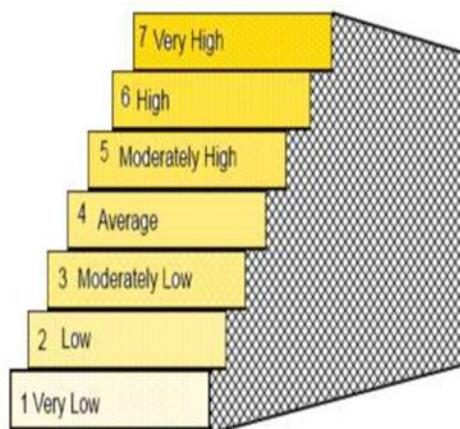
Keywords: Somatotype, Personality, Constitutional Psychology, Morphological Components.

Introduction

Emotional means concerned with your emotions and the way you are feeling rather than physical health or condition. Deprivation means that you do not have or are prevented from having something that you need or want (Collins 1987). Deprivation has many faces: the child grows in a culturally and educationally non-stimulating home, handicapped by environmental deprivation; the presence of a non-caring, non-loving mother, tending for maternal deprivation; the child is unloved and rejected by his parents, suffers emotional deprivation; and the child who lives in institutional care yet again experiences emotional deprivation. The destitute children are put up in the orphanages and it can be said that they are emotionally deprived. Children come to orphanages not according to their own will but their destiny brings them there. The health problems of children residing in orphanages are complex and clearly related to the sub-standard living conditions in the institutions. Growth failure secondary to emotional deprivation

can be transient or sustained depending on the duration of institutionalization. According to Census of India (2001), India has 391,399,591 children in the age range of 0-19 years, accounting for the second largest child population in the world. The unofficial reports present that there are 32 million destitute in our country. While some are eking out a miserable and endangered existence, struggling for survival on streets, at stations or as child labour, a large number are in orphanages and institutions, which are run either by the government or NGOs. Data regarding orphans and orphans in need is not available in government records. UNAIDS (2006) provides information that in India, the children(0-17 years) orphaned due to all causes by the end of 2005 are estimated to be 25,700,000 as compared to the world estimate of 132, 700,000.

Sheldon wanted to do more than merely confirm the existence of certain components of physique. He wanted to produce a useful scientific tool for measuring the effects of these components. Therefore, a numeric value needed to be applied to each of the components. He chose a scale of seven degrees. Odd numbers are a good choice for this kind of scale, because it allows a central balance point. A verbal equivalent of his scale looks like this:

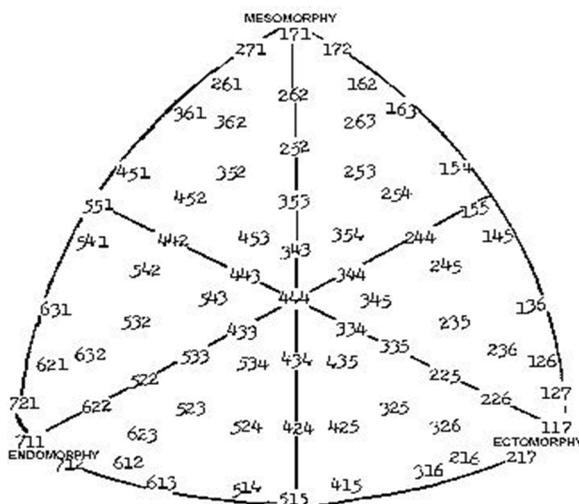


Working with somatotypes over time, Sheldon became so sensitive to the subtleties that it enabled him to expand this to a 13 point scale. 1, 1½, 2, 2½, 3, 3½... The final form for expressing a somatotype numerically is with three numbers, where the left number represents the degree of endomorphy, the middle number indicates the degree of mesomorphy, and the final or right number represents the degree of ectomorphy. An extreme endomorph is represented as a



7-1-1. An extreme mesomorph is represented as 1-7-1. And finally the numbers 1-1-7 represent an extreme ectomorph. A 4-4-4 would be a balanced somatotype with each of the three components being equally represented.

Another part of Sheldon’s work that persists is his chart of somatotypes. It is an attempt to aid in the visualization of the relationships between the various somatotypes. A tetrahedron would be the ideal way to view the relationships, but this is a serious challenge for the average person’s spatial abilities. Instead, he flattens it out into a curvilinear triangle, also referred to as a Reuleaux triangle. The figure below is how this is typically illustrated.



Making Somatotyping Objective:

Originally, somatotyping could best be described as an art, skill, or technique that you had to “get good at.” This was discouraging to researchers. It was hard enough to put together an experiment that required nude photographs of the subjects, let alone dealing with the long learning-curve to be able to make accurate assessments that were basically educated guesses. Science is about replicating experiments and verifying the evidence collected. Since Sheldon and some of his close associates were the only ones skilled in these techniques, it is easy to see the danger of a conflict of interests. A somatotype that required interpretation might be weighted in favor of the desired experimental results.

Sheldon was not ignorant of the need to make somatotyping completely objective. Throughout his career he experimented with various direct physical



measurements of a subject in addition to the photographs. Finally, around 1968, he published a paper answering criticisms of his methods.

Viewing Somatotypes through the perspectives of Constitutional Psychology:

The constitutional perspective, which examines the relationship between the structure of the human body and behavior, seeks to answer this question (Genovese, 2008). The first comprehensive system of constitutional psychology was proposed by American psychologist William H. Sheldon (1940, 1942). He believed that your body type can be linked to your personality. Sheldon's life's work was spent observing human bodies and temperaments. Based on his observations and interviews of hundreds of people, he proposed three body/personality types, which he called somatotypes. The three somatotypes are ectomorphs, endomorphs, and mesomorphs. Ectomorphs are thin with a small bone structure and very little fat on their bodies. According to Sheldon, the ectomorph personality is anxious, self-conscious, artistic, thoughtful, quiet, and private. They enjoy intellectual stimulation and feel uncomfortable in social situations. Actors Adrien Brody and Nicole Kidman would be characterized as ectomorphs. Endomorphs are the opposite of ectomorphs. Endomorphs have narrow shoulders and wide hips, and carry extra fat on their round bodies. Sheldon described endomorphs as being relaxed, comfortable, good-humored, even-tempered, sociable, and tolerant. Endomorphs enjoy affection and detest disapproval. Queen Latifah and Jack Black would be considered endomorphs. The third somatotype is the mesomorph. This body type falls between the ectomorph and the endomorph. Mesomorphs have large bone structure, well-defined muscles, broad shoulders, narrow waists, and attractive, strong bodies. According to Sheldon, mesomorphs are adventurous, assertive, competitive, and fearless. They are curious and enjoy trying new things, but can also be obnoxious and aggressive. Sheldon (1949) also conducted further research into somatotypes and criminality. He measured the physical proportions of hundreds of juvenile delinquent boys in comparison to male college students, and found that problem youth were primarily mesomorphs. Perhaps it's because they are quick to anger and don't have the restraint demonstrated by ectomorphs. Maybe it's because a person with a mesomorphic body type reflects high levels of testosterone, which may lead to more aggressive behavior.

Studies on the role of extreme maternal neglect and emotional deprivation on the development of children are exceedingly rare in the last decade of the last century. The effects of bleak care due to institutionalized environment were studied initially by Goldfarb (1945) and Spitz (1945). A longitudinal follow up study by Stock and Smythe (1976), over an 11 year period of emotionally



undernourished children exhibited reduced intellectual and physical development. Data on the changes in somatotype with reference to socio-economic differences are meagre (Bodzsar, 1982; Rangan, 1982). Mortan's (1967) report on the Medford boys, aged 9 to 16 years showed that the somatypes clustered about 3-4-3, with a tendency towards increasing ectomorphy. Rangan's (1982) study elucidated that boys from middle and lower class are more ectomorphic than those from upper class, which had central somatypes and higher endomorphy. He speculated that low mesomorphy and high ectomorphy for his subjects may be in part genetic and in part due to under-nutrition. Talwar et al. (1994) studied somatypes of 499 Punjabi girls belonging to higher and lower income groups of Chandigarh. They concluded that higher income group girls were more endomorphic than their lower income group coevals at all age levels (9 to 16 years). The mesomorphic component exhibited a trend of decrease in both the groups. While the lower socio-economic group girls showed higher mesomorphic rating compared to their counterparts. There is also an indication that the three components of somatotype do not vary on regular basis with age ; they may increase at one age and decrease at the other. This is at par with the findings of Tanner (1970); Kansal (1981) on Jat Sikhs and Baniyas of Punjab ; Eiben (1985) on Hungarian boys ; Bhasin and Singh (1992) on Bodhs and Baltis of Ladakh and J&K and Kumar et al. (1997) on Delhi-born Bengali Kayastha boys. It can be summarized that good nutrition is not enough for the smooth outcome of emotional development but more important is the element of joie de vivre which is enhanced by emotional security itself. Results of the different study elaborate that the emotionally deprived adolescents, on the whole do not grow like their contemporary control counterparts. Importantly, growth in children refers to more than just height and weight patterns but to extends to the other variables including somatotype as well.

Somatotype described in relation to Morphological Components:

In the framework of our research (Suchomel 2000) focused on characteristics of school-aged individuals with low (significantly below-average) and high (significantly above-average) level of basic motor performance, we studied the relation between somatotype and motor performance. In the submitted contribution we present our findings. A lot of researches focused on methods of determination of somatotype have been done by various authors (Hippokrates; Hallé and the French School with Rostan and Sigaud; De Giovanni and the Italian School with Viola; the German School with Kretschmer and Conrad; Škerlj with Brožek and Hunt; Lindegård; Sheldon and his followers Parnell, Heath, Carter and Howells; Tanner; in the Czech Republic Blažek; Greil and Baudisch and many others), the survey of which was published by Bok (1972),



Greil, Baudisch (1994). We found the method according to Heath and Carter (Heath, Carter 1967, Carter 1975) the most suitable for the purpose of our research. Recently, this method has been the most widespread method of determining the so-called anthropometric somatotype, it seems well elaborated and acceptable for physical education research (Bok 1972). The authors of the method followed up the works of Sheldon et al. (1940) that had introduced the term somatotype of an individual and defined it as a relation of morphological components expressed by three figures. These figures describe three basic components of human stature: endomorphy, mesomorphy and ectomorphy. As the results of published findings dealing with relations of the components of somatotype of school-aged boys and girls show, there is mostly a significantly negative relation of endomorphy and mesomorphy to ectomorphy, and a significantly positive relation of mesomorphy to endomorphy, which is even more typical for girls and women (Štěpnička et al. 1976, 1987, Netolická 1991, Riegerová 1994). As for the relation between somatotype and biological age, the results have shown that high values of the ectomorphic component signal later maturity, on the other hand individuals with lower relative length of body segments mature earlier. Accelerated boys are, within the generally understood somatotype, more endomorphic, with lower mesomorphy and a tendency to medium types. Boys with average biological age are significantly mesomorphic and have athletic figure, retarded boys are rather ectomorphic, with significantly lower endomorphy up to the age of 17 (Riegerová 1994).

Somatotype described in relation to the Momentary Morphological State:

Somatotype describes the momentary morphological state of an individual. Different somatotypes have different morphological predispositions to physical activity and their reactions to physical activity are different, too. To a certain extent, according to the morphotype, we can predict the level of motor performance since the child's lower school age. Apart from other neurophysiological and psychological factors, suitable somatotype, especially the dominance of the mesomorphic component, is one of the conditions of excellent performance at various sports (Riegerová, Vodička 1992, Riegerová 1994). The relation between somatotype and motor performance has been studied by a series of Czech experts. At first, the subjects of studies were top sportsmen in some disciplines (Štěpnička 1977). After that, research dealing with children population of pre-pubescent and pubescent age followed (Štěpnička et al. 1976, 1987, Bursová 1990a, 1990b, Chytráčková 1990, 1995, Netolická 1991, Riegerová 1984, Riegerová, Vodička 1992). Summarizing the results of the studies mentioned above we can state that the relation of the individual components of somatotype to motor performance is rather ambiguous. The value of the ectomorphic component was usually either in a positive relation to the



performances in motor performance tests or there was no evident relation between them. No significant relation between mesomorphy and the results of the children in motor performance tests was proved. In most cases, the endomorphic component had a significantly negative relation to the results of the children in motor performance tests. The best results in the tests were reached by ectomorphic mesomorphs while the worst results were reached by endomorphs, with no inter-sexual differences.

Conclusion:

From the point of the work of Bursová (1990b) published an interesting analysis of the somatic characteristics of selected motorically considerably above-average and motorically considerably below-average boys. Unfortunately, the results of this research cannot be fully used due to quite a low number of participants (7 motorically above-average and 9 motorically below-average boys of different ages). In the conclusions, the author stated that the motorically above-average individuals, as for their somatic characteristics, showed a significant similarity. The selected individuals were characteristic by ectomorphic mesomorphy or mesomorphic ectomorphy, with very low endomorphy. On the contrary, the significantly below-average individuals did not show any tendency which would unambiguously characterize their somatic profile. At present, school-aged children can be divided into categories of somatotypes according to their motor performance suggested by Štěpnička et al. (1976) and into 5 categories marked A to E adapted by Chytráčková (1990). The best results in the motor performance tests were reached by boys and girls from the D category (with dominant ectomorphy) and the B category (with dominant mesomorphy). On the contrary, the worst results were reached by boys and girls from the C category (endomorphs), or, if these were absent in the measured samples, children from the A category (especially endomorphic mesomorphs and medium somatotypes – Netolická 1991, Chytráčková 1995). Sheldon's method of somatotyping is not without criticism, as it has been considered largely subjective (Carter & Heath, 1990; Cortés & Gatti, 1972; Parnell, 1958). More systematic and controlled research methods did not support his findings (Eysenck, 1970). Consequently, it's not uncommon to see his theory labeled as pseudoscience, much like Gall's theory of phrenology (Rafter, 2007; Rosenbaum, 1995). However, studies involving correlations between somatotype, temperament, and children's school performance (Sanford et al., 1943; Parnell); somatotype and performance of pilots during wartime (Damon, 1955); and somatotype and temperament (Peterson, Liivamagi, & Koskel, 2006) did support his theory. Even though some personality theorists have chosen to dwell upon these factors, they have in general shown little inclination to implement the crucial biological factors.



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DESIGNING AND SIMULATION OF MULTILEVEL STATCOM ON CASCADED TOPOLOGY

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Abstract

This paper manages recreation of STATCOM utilized for consonant decrease with the assistance of staggered VSI circuit. Full converter based staggered inverters are utilized for medium to high power receptive pay application. Voltage unbalance is one of the fundamental restrictions of full based staggered STATCOM. A straightforward control methodology is proposed for the voltage equalization of a full two dimension inverter based STATCOM. The topology comprises of two traditional three stage two dimension inverters associated in course. The two inverters work at two diverse dc interface voltages to acquire four dimension activity at STATCOM out-put. Recreation thinks about are done to foresee the presentation of the proposed control procedure. The results in STATCOM because of the voltage swell are diminished. Accordingly, the extent of inductor and DC capacitor can be diminished. The STATCOM has the extraordinary preferred position of a less number of gadgets. The VSI is amazingly quick in light of responsive power change. The recreation of the STATCOM is performed in the Simulink condition and the outcomes are introduced.

Keywords: STATCOM, DC Capacitor, Voltage Ripple, Multi Level Inverter.

1. Introduction

A Flexible AC Transmission System (FACTS) is an AC transmission framework fusing power electronic-based or other static controllers which give better power stream control and upgraded dynamic soundness by control of at least one air conditioning transmission framework parameters (voltage, phase angle, what's more, impedance) The STATCOM is customarily demonstrated for power stream examination as a PV or PQ transport contingent upon its essential application. The dynamic power is either set to zero (ignoring the STATCOM misfortunes) or determined iteratively. The STATCOM voltage and receptive power pay are typically related through the attractive of the STATCOM. This customary power stream model of the STATCOM ignores the effect of the high recurrence impacts

and the exchanging attributes of the power hardware on the qualities of the power gadgets on the dynamic power misfortunes and the receptive influence infusion (retention). The STATCOM used to manage voltage and to improve dynamic strength. There are a few varieties of the STATCOM. It is made out of inverters with a capacitor in its dc side, coupling transformer, and a control framework. The inverters are, in traditional STATCOM's; exchanged with a solitary heartbeat for every period and the transformers are associated so as to give symphonious minimization. The gear activity is made through the persistent and brisk control of capacitive or inductive receptive power. Its yield voltage is a waveform made out of heartbeats that approaches a sinusoidal wave.

2. Statcom& its Operating Principle

The per phase equivalent circuit is shown in Figure1. Where V_G is ac source voltage, V_C is STATCOM output voltage, I_C is the current drawn by STATCOM, L is transformer leakage inductance and 'r' is the resistance that represents the losses of the system.

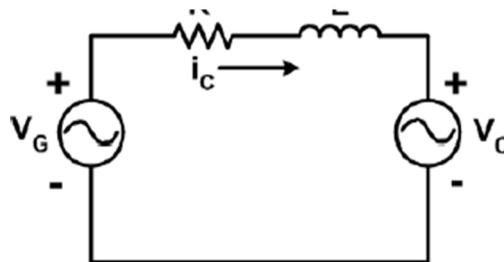


Fig. 1 Equivalent circuit diagram of STATCOM

The STATCOM is essentially a DC-AC voltage source converter with a vitality stockpiling unit, for the most part a DC capacitor. It works as a controlled Synchronous Voltage Source (SVS) associated with the line through a coupling transformer. Fig. 1 demonstrates the Equivalent circuit outline of STATCOM. The controlled yield voltage is kept up in stage with the line voltage, and can be controlled to draw either capacitive or inductive current from the line along these lines of a synchronous condenser, however substantially more quickly. STATCOM can keep up full capacitive yield current at low framework voltage, which likewise improving the transient solidness. A Phase-moved Unipolar SPWM exchanging plan is proposed to work the switches in the system. The plot which is a somewhat changed adaptation of stage moved SPWM. The exchanging recurrence of the individual switch is 1 kHz. The sounds of the STATCOM yield voltage just show up around 6 kHz, 12 kHz, etc. Fundamentally, a STATCOM yield voltage dependably contains sounds, because of the exchanging conduct of the VSI. These voltage sounds will create

symphonious flows and further reason control misfortunes in the framework organize. On the off chance that the impedance of the lines that associate a STATCOM to the power framework is dismissed, the consonant misfortunes are fundamentally clear on the association transformer. The impact of these misfortunes in the transformer can be investigated by thinking about a development of the transformer impedance.

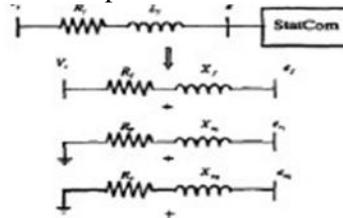


Fig.2. STATCOM Model for Harmonic losses

Fig.2 shows the circuit of a STATCOM connected to a power system by a connection transformer, where V , and e represent the system RMS voltage and the STATCOM's RMS output potential respectively, and R_T and X_T denote the resistance and leakage reactance of the connection transformer. Assuming that there are not any harmonics in the system voltage V , the STATCOM's output voltage e consists of fundamental and high-order harmonics, and may be represented as:

$$\begin{aligned}
 e &= e_f + e_{n1} + e_{n2} + \dots \dots \dots \\
 &= e_f + \sum_{i=n1, n2, \dots} e_i \quad (1)
 \end{aligned}$$

Where e_f , is the RMS value of the fundamental harmonic, e_i , represents the RMS values of high-order harmonics, and $n1, n2$ are the harmonic indices. Thus, the first diagram of Fig 2 can be represented as the sum of the other harmonic diagrams

The harmonic losses on the connection transformer can be expressed as:

Usually, the magnitude of a STATCOM's output voltage relates to the

$$\begin{aligned}
 &= P_{fundamental} + \sum_{t=n1/n2} \frac{e_t^2 * R}{R^2 + X_f^2} \quad (2) \\
 &= P_{fundamental} + \sum_{t=n1/n2} \frac{e_t^2 * R}{R^2 + t^2 X_f^2}
 \end{aligned}$$

STATCOM's DC side voltage and the conduction mode of the STATCOM's VSI. For example, if the VSI applies the square wave conduction mode, the output voltage magnitude is a function of the DC side voltage and the firing angles of the VSI. If the PWM mode is used, the output voltage magnitude is a function of the DC side voltage and the duty cycle ratio of the PWM. In the following parts of this paper all derivations will be based on PWM assumption.



Therefore using PWM, the output voltage magnitude of the STATCOM can be expressed as

Where K is the duty cycle ratio. Since, e_t is directly proportional to the DC side

$$e_t = f_t(V_{dc}, K) \text{ Where } t=n_1, n_2, \dots (3)$$

voltage V, equation (3) can be simplified as

$$e_t = V_{dc} * f_t(K) \text{ Where } t=n_1, n_2, \dots (4)$$

Substituting equation (4) into equation (2), the losses caused by the high order harmonics can be expressed as

From equation (6) it can be seen that the high order harmonic losses relate to

$$P_{harmonics} = V_{dc}^2 + \sum_{i=n_1/n_2} \frac{f_i^2(K) * R_f^2}{R^2 + i^2 X_f^2} \quad (5)$$

$$\frac{1}{R_h} = \sum_{i=n_1/n_2} \frac{f_i^2(K) * R_f^2}{R^2 + i^2 X_f^2} \quad (6)$$

the STATCOM' operating point and vary with the duty cycle ratio. Typically, when a STATCOM is in steady-state operation, the duty cycle ratio does not change or changes in a very limit range. The STATCOM's output reactive power is regulated through firing angle change. Then R_h is treated as a constant.

Equation (5) also implies that the high order harmonic losses can be equivalently represented as the active power losses caused by a DC side shunt resistor.

3. Control of Reactive Power

It is well known that the amount and type (capacitive or inductive) of reactive power exchange between the STATCOM and the system can be adjusted by controlling the magnitude of STATCOM output voltage with respect to that of system voltage. The reactive power supplied by the STATCOM is given by Equation (7) below,

Where $V_{STATCOM}$, and V_s are the magnitudes of STATCOM output voltage and system voltage respectively and X is the equivalent impedance between

$$Q = V_{statcom} - V_s \quad (7)$$

STATCOM and the system. When Q is positive, the STATCOM supplies reactive power to the system. Otherwise, the STATCOM absorbs reactive power from the system. Since the modulating signals are the same for the inverters in the system, the fundamental component of the STATCOM output voltage is N



times of that of each inverter, provided that the voltage across the DC capacitor of each inverter is the same. As a result, the STATCOM output voltage can be controlled by the Modulating Index (m_a). $V_{STATCOM}$ is proportional to m_a , as long as the individual inverter is in the linear modulating region. Due to its ability to control the output voltage by the modulating index, the proposed STATCOM has extreme fast dynamic response to system reactive power demand.

4. Control of Dc Capacitor Voltage

If all the components were ideal and the STATCOM output voltage were exactly in phase with the system voltage, there would have been no real power exchange between STATCOM and system therefore the voltages across the DC capacitors would have been able to sustain. However, a slight phase difference between the system voltage and the STATCOM output voltage is always needed to supply a small amount of real power to the STATCOM to compensate the component loss so that the DC capacitor voltages can be maintained. This slight phase difference is achieved by adjusting the phase angle of the sinusoidal modulating signal. If the real power delivered to the STATCOM is more than its total component loss, the DC capacitor voltage

$$P = \frac{V_s V_{statcom}}{X} \sin(\delta) \quad (8)$$

will rise, and vice versa. The real power exchange between STATCOM and the system is described by Equation (8) below,

Where δ is the phase angle difference between STATCOM voltage and the system voltage

5. Ripple of Dc Capacitor Voltages & Sizing of the Dc Capacitor

DC capacitors not only play an important role in STATCOM system performance, but comprise a big chunk of the total system cost as well. Hence, proper sizing of the DC capacitors is essential to the low system cost and high performance of the proposed STATCOM.

(a) DC Capacitor Voltage

Under the assumptions that 1) the harmonic components centered around switching frequency and its multiples are negligible; 2) the DC capacitor voltage ripple is small and 3) system voltage $e(t)$ is sinusoidal, we have in steady state, the following equations.

$$SW(t) = m_a \sin \omega t \quad (9)$$

$$i_L(t) = I \sin(\omega t + \phi_i) \quad (10)$$

In the above equations, I is the inductor peak current, m_a is the Modulating



Index (MI), and $\Phi_i=90^\circ$ when the resistor R approaches zero. Equations (3) (5) and (6) result in Equation (11) below

$$V_c(t) = V_{dc} + \frac{1}{4\omega C} m_a I_m \cos 2\omega t \quad (11)$$

(b) Sizing of the DC Capacitors

From Equation (8), once the ripple value is specified, the size of DC capacitor can be calculated by equation (9) below.

$$C = \frac{m_a I}{2\omega \Delta V_c} \quad (12)$$

To keep the ripple voltage within the specified value in the full range of reactive power of the STATCOM, m_a in Equation (12) should be set to 1.

6. Rejection of Current Harmonics Caused By Dc Capacitor Voltage Ripple

The DC capacitor voltage swell will make inductor current i_L have third request symphonious part. In the event that this symphonious segment can be rejected, the span of the inductor L and DC capacitors can be additionally decreased. A strategy to dismiss consonant brought about by DC voltage swell, where the DC voltage swell is autonomous of the inverter current. Sadly, the DC voltage swell is relative to the inverter current in the proposed STATCOM. Rather than $m_a \sin \omega t$, a somewhat altered form,, is picked as the regulating signal. For this situation, the inductor current will have no low request consonant segments. Another alternative to dismiss the symphonious segment is to utilize condition (10) straightforwardly as the adjusting signal. Since the DC voltage swell recurrence is much lower contrasted with the resultant STATCOM exchanging recurrence ($2Nf$), the exchanging capacity will approach, if Equation (10) is utilized as the balancing signal.

7. Simulation Results

Mat lab modeling control system of STATCOM is shown in Fig3. Matlab model of three bus system with STATCOM and shown in Fig 3a Multilevel inverter is represented as a two level inverter. Cascaded topology based multilevel voltage inverter is shown in Fig 3b. Source voltage, Source current and STATCOM current as shown from Fig3c, Cascaded multi level inverter output voltage as shown from Fig3d The frequency spectrum for the injected voltage and source current is shown in Fig 4&4a. It can be seen that the harmonic reduction of loads reaches normal value due to the voltage injection.



Conclusion

This paper presents three phase STATCOM based on the two level cascades VSI, which permits to fulfill various tasks. To verify properties of the proposed conditioner's a down scale hardware model was developed- conditioner can free from higher harmonics source current, even in situation of strongly deformed load current, conditioner stabilizes load voltage in situation of source voltage magnitude variations, conditioner possess the reactive power compensation capability, conditioner possess the capability of balancing the unbalanced loads in conditions of balanced source.

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WOMEN ENTREPRENEURSHIP DEVELOPMENT IN INDIA

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Abstract

Women entrepreneurship development is an essential part of human resource development in India. Women entrepreneurship in India is very poor, especially in the rural areas. Entrepreneurship amongst women has been a recent concern. Women have become aware of their existence, their rights and their work situation; however women of middle class families in urban cities.

This paper focuses on women entrepreneur. Any understanding of Indian women, of their identity and especially of their role taking and breaking new parts, will be incomplete without a walk down the corridors of Indian history where women have lived and internalized various role taking and breaking new paths will be incomplete of without a walk down the corridors of Indian history where women have lived and internalized various role models. The paper talks about the status of women entrepreneurs and the problems faced BY them when they ventured out to carve their own niche in the competitive world of business environment.

Key Words: Entrepreneur, Empowerment, Stereotype, Identity, Community, Mobility.

Introduction

Somebody once said educate a women and you will educate a family. I am saying empower a women to become an entrepreneurs, and you will create an entire family of entrepreneurs. Women entrepreneurship is the need of the nation right now; it is the surest quickest way to make India super power. Gone are the days when women were considered no match for all powerful men in this world. The new generation women across the world have overcome all negative notions and have proved themselves beyond doubt in all spheres of life including the most intricate and cumbersome world of entrepreneurship. When have come a long way from just being a homemaker Narendra modi's start up friendly environment In the country has proved to be a blessing for female entrepreneurs and instrumental in fighting gender stereotyping in the business community. People don't take opportunities because the timing is bad. The financial side unsecured too many people are over analyzing sometimes you just have to go for



it. A recent study published in American political science review found that in collaborative group settings, “ the time that men spoke”, “ now were not scientists, but this looks like good social conditioning once again, men are encouraged to speak up you won’t go anywhere and no one will see your vision including you yourself.

“It can be seen that the growth of women entrepreneurs in India is not better than other countries if the society is a vehicle both men and women are its two wheels contributions of both women and men are required to the activities of building a notion

Women entrepreneur may be defined as a women or group of women who initiate, organize and run a business enterprise. In terms of Schumpeterian concept of innovative entrepreneurs, women who innovate, imitate or adopt a business activity are called “women entrepreneurs”

The government of India (GOI2006) has defined women entrepreneur as “an enterprise owned and controlled by a women having a minimum financial interest of 51 per cent of the capital and giving at least 51per cent of the employment generated in the enterprise to women.”

Factors Influencing Women Entrepreneur:

1. Building confidence
2. Developing risk taking ability
3. Economic independence
4. Establishing their own identity
5. Establishing their own identity
6. Motivation
7. Equal status in society
8. Greater freedom and mobility
9. Achievement of excellence

Since time in memorial women are contributing a great deal to the development of any nation across the world. It goes without saying that Indian women entrepreneurs have significantly contributed to the industrial development of India. Apart from giving good citizens to the nation women have also given good organizations to the nation obviously, what man can do, women can do better through their dedication and commitment. This has been proved time and again in the analysis of Indian business history. Under the stewardship of women scores of industries have made rapid strides and progress the business models and management styles followed women entrepreneurs worth replicating across the world there is saying where women are respected dwells god. Similarly where women are there in the industry dwells progress and prosperity.



A survey shows the following reasons for women to become the entrepreneur

1. Lack of job opportunity.
2. The increasing cost of living.
3. Due to high education they are entering in to entrepreneurial activities.
4. A lot of opportunities in a market.
5. Family background of having business.

Now a days in Indian women are willing to accept challenges and assume responsibility in economic, social, political groups, generally they engage them in tiny or small cottage industries but recent study show women have been starting ventures in all the sector equivalent male.

In India women, entrepreneurs are classified as follows.

1. Women with adequate education and professional qualification get engaged in the business.
2. Middle class women who have an education but lack training.
3. Women who take up a business enterprise who face financial difficulties.

Government of India has made certain efforts through industrial policies, they are:

1. 7-5 year plan

This plan has included a special provision for the development of women 1991 industrial policy highlights a special training program to develop women entrepreneur the objective of these plans was to increase the field of small industry and to create self-employment

2. 8-5 years plan

This plan gave importance to the development of the SSI sector before the implementation of this plan the percentage of women entrepreneur was 9% and was targeted to 20%

In 1996 the department of SSI under the ministry of industry had taken initiative to

10 lakh women entrepreneurs through various schemes like

1. Mahila Gramudyog Scheme.
2. Jawahar Rojagar Uyojaga Scheme.
3. Ibis Mahila Udyog Vidhi
4. Urban poverty education program
5. Scheme of NABARD
6. Shakti package for women's
7. Schemes of SBI

These were to stimulate growth among women.



Problems of Women Entrepreneurs

1. Problem of raw material
2. Marketing problem
3. Infrastructure problem
4. Lack of awareness
5. Lack of family support
6. Low of business information
7. Low of risk bearing ability
8. Limited mobility
9. Competition
10. Male dominance
11. Accounting and bookkeeping.
12. Negative attitude

Conclusion

Entrepreneurship among women, no doubt improves the wealth of the nation in general and of the family in particular. Women today are more willing to take up activities that were once considered the preserve of men and have proved that they are economy. Women Entrepreneurship must be molded properly with entrepreneurial traits and skills to meet the changes in trends challenges global markets and also be competent enough to sustain and strive for excellence in the entrepreneurial arena.

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आधुनिककाले भगवद्गीतायाः प्रासङ्गिकता

डा. ए. सच्चिदानन्दमूर्तिः
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राष्ट्रीयसंस्कृतविद्यापीठम्, तिरुपति:

भगवता श्रीकृष्णेन गीतमिदं श्रीमद्भगवद्गीताशास्त्रं महाकविव्यासप्रणीतस्य महाभारतस्य अङ्गत्वेन विराजते । गीतेयं श्रीमन्महाभारते भीष्मपर्वणि पञ्चविंशदारभ्य द्विचत्वारिंशदध्यायपर्यन्तं व्याप्या वर्तते । भगवद्गीता नाम -

भगवता गीता ।

भगवतः गीता ।

भगवती गीता ।

भगवद्गीतायाम् अष्टादशाध्यायाः सन्ति । सप्तशतं श्लोकाः समुपलभ्यन्ते । इयं च गीता कर्म-भक्ति-ज्ञानमिति षट्कत्रयरूपेण विभक्तमस्ति ।

गीतासुगीता कर्तव्या किमन्यैशास्त्रविस्तरैः ।

या स्वयं पद्मनाभस्य मुखपद्माद्विनिश्रुता ॥

साक्षात् श्रीकृष्णपरमात्मनः मुखारविन्दात् आविर्भूता गीता एका एव पर्यासा मानवजीवनविकासाय साफल्याय भवति ।

सम्प्रति मनुष्यः स्वबुद्ध्या विवेकेन च समग्रममुं प्रपञ्चं करतलामलकवत् नियमितुं प्रभवति । किन्तु न स्वात्मानम् । मानवदृष्टिः बाह्यविषयेष्वेव प्रसरति न स्वात्मनि । तस्मादेव समाजे अशान्तिः अनुदिनं प्रवर्धते । नैतिकमूल्यानि नष्टं गतानि । 'ज्ञानं हि तेषामधिकोविशेषः इति प्राणिकोटिषु मानवस्य विशेषता । परन्तु अयं मनुष्यः कामक्रोधादिभिराविष्टस्सन् युक्तायुक्तं, धर्माधर्मं, कर्तव्याकर्तव्यं च परित्यज्य सर्वं स्वार्थं समीहते । इति वत् स्वार्थायैव प्रवर्तते । अनेन मनुजस्य बाह्योन्नतिः सिध्यति न तु आत्मोन्नतिः । मनुजस्य बाह्योन्नतिः आत्मोन्नतिः भगवद्गीतया सिध्यते ।

प्राचीनशास्त्राणि निवृत्तिमार्गमेव उपदिशन्ति । परं गीताशास्त्रं प्रवृत्तिधर्मं निवृत्तिधर्मं च समन्वयं कुर्वत् मानवजीवनादर्शान् निरूपयत् नित्यजीवने आदर्शग्रन्थत्वेन समजायत ।



भगवद्गीता धर्मशब्देन समारभ्यते । धर्मस्तु मानवसमाजस्य उद्धारको भवति । पामरैः
आश्रितम् अस्वर्ग्यम् अकीर्तिकरं मनोव्याकुलत्वम्, अधैर्यं माऽप्नोतु। तस्माद् क्षुद्रं
मनोदुर्बलत्वं परित्यज्य उतिष्ठ। कर्तव्यरतो भव । यथा-

कुतस्त्वा कश्मलमिदं विषमे समुपस्थितम् ।

अनार्यजुष्टमस्वर्ग्यमकीर्तिकरमर्जुन ॥

क्लैब्यं मा स्म गमः पार्थ नैतत्त्वय्युपपद्यते ।

क्षुद्रं हृदयदौर्बल्यं त्यक्त्वोतिष्ठ परन्तप ॥ इति। भगवद्गीता- २/२,३

एतत् श्लोकद्वयं समाजे विषमस्थितैः विद्यमानस्य पुरुषस्य हृदयदौर्बल्यं दूरीकृत्य
स्वकर्तव्यतां बोधयति ।

विद्याविनयसम्पन्ने ब्रह्मणे गवि हस्तिनि ।

शुनिचैव स्वपाके च पण्डितास्समदर्शिनः ॥ भगवद्गीता- ५/१८

उपर्युक्तविषयेषु समं ये पश्यन्ति तादृशाः समदर्शिन एव पण्डिताः भवन्ति इति भावः।

आधुनिकसमाजे अस्मास्वपि पण्डिताभिधेयाः नैके भवन्ति । परं तेषां मानवेष्वेव
समदृष्टि नैव भवति किमु अन्यप्राणिषु । सम्प्रति भेददृष्टिः अभिवर्धते । परोपकारदृष्टिस्तु
क्षीयते । तस्मादेव अस्माकमशान्तिः। तस्मात् अस्माभिः एतेषु विषयेषु आत्मावलोकनं
कर्तव्यम् ।

काम एष क्रोध एष रजोगुणसमुद्भवः ।

महाशनो महापाप्मा विद्ध्येनमिह वैरिणम् ॥ भगवद्गीता- ३/३७

रजोगुणात् समुत्पन्नाः कामक्रोधादयः त्वां बलात् पापकर्मसु नियोजयन्ति अस्माकं
नित्यजीवनेऽपि एतादृशा प्राग् पदे पदे समुद्भवन्ति । असत्यं न वक्तव्यम्, अधर्मं न
चरितव्यम्, धूमपानं सुरापानं च न कर्तव्यम् इति नित्यं चिन्तयन्त एव वयं तेष्वेव कर्मसु
बलात् प्रवर्तामहे। भगवतः वचनं यदि सम्यगवगच्छामः, तर्हि अवश्यं वयं कामक्रोधेभ्यः
दूरे तिष्ठामः ।

कर्मण्येवाधिकारस्ते मा फलेषु कदाचन ।

मा कर्मफलहेतुर्भूर्मा ते सङ्गोऽस्त्वकर्मणि ॥ इति । भगवद्गीता- २/४७



फलाशक्त्या यदि कर्म क्रियते, तर्हि कदाचित् प्रारब्धवशात् फलं नैव लभ्येत । तदा खिन्नो भवति । निष्कामभावनया यदि कर्म करोति, तर्हि फलाभावेऽपि दुःखं नैव भवति । फलं भवति चेत् सानन्दम् अनुभवति । लोके कश्चित् क्रीडाकारः फलमपेक्ष्य क्रिकेट् क्रीडति, कदाचित् सः पराजितो भवति । तेन चिन्तितं फलं सः नैव लभते । ततश्च खिन्नो भवति । अपरस्तु कश्चित् कर्तव्यबुद्ध्या फलमनपेक्ष्यैव क्रिकेट् क्रीडति सः पराजितः चेदपि व्याकुलो न भवति । यदि समीचीनं फलमायाति उभयोरपि समानम् । किन्तु निष्कामकर्मिणः मनसः निर्मलत्वं भवतीति विशेषः ।

“One Man’s God is another’s devil ” एनां पद्धतिं निराकरोति भगवतीता । यथा –

यो यो यां यां तनुं भक्तः श्रद्धयार्चितुमिच्छति ।

तस्य तस्याचलां श्रद्धां तामेव विदधाम्यहम् ॥ इति । भगवद्गीता- ७/२१

सम्प्रति समाजे मानवः स्वकर्तव्यपरिपालने उद्वेगमनुभवन् दृश्यते । तदर्थमेव इदानीं Stress Management नाम्ना सर्वत्रापि विद्वांसः कार्यशाला निर्वहन्ति । एतदर्थं भगवता श्रीकृष्णेन गीतायां बहूनि साधनानि निर्दिष्टानि । यथा –

तत्रैकाग्रं मनः कृत्वा यतचित्तेन्द्रियक्रियः ।

उपविश्यासने युञ्ज्याद्योगमात्मविशुद्धये ॥

समं कायशिरोग्रीवं धारयन्नचलं स्थिरः ।

सम्प्रेक्ष्य नासिकाग्रं स्वं दिशश्चानवलोकयन् ॥ इति । भगवद्गीता- ६/१२,१३

अद्यतनकाले बहूनाम् महती समस्या भवति मानसिकसमस्या । अर्जुनस्यापि तादृशी स्थितिरेव आसीत् । अस्मदनुभवमेव अर्जुनः प्रतिनिधित्वेनात्र स्पष्टयति –

चञ्चलं हि मनः कृष्ण प्रमाथि बलवद्दृढम् ।

तस्याहं निग्रहं मन्ये वायोरिव सुदुष्करम् ॥ इति । भगवद्गीता- ६/३४

इयं च समस्या अस्माकं समेषामपि वर्तत एव । अर्जुनस्यैव मनसः संयमनं वायोरिव सुदुष्करं चेत् । किमु वक्तव्यम् अस्मद्विषये । वयं मनसा एव बलात् निन्द्यकर्मस्वपि प्रवर्तामहे । कर्तव्याकर्तव्ये प्रमादमनुभवामः । वासुदेवस्य वचनमनुसृत्य अभ्यासेन शनैः शनैः मनसः निग्रहः कर्तव्यः । तेन लक्ष्यसाधने समर्थो भवामः ।



आधुनिककाले IT Bhoom प्रति बहवः आकर्षिताः । ये स्वधर्मं त्यक्त्वा गताः ते प्रत्यागताः । स्वधर्माचरणश्रेष्ठत्वं गीतायां सुष्ठु प्रतिपादितं यथा-

श्रेयान् स्वधर्मो विगुणः परधर्मात् स्वनुष्ठितात् ।

स्वधर्मं निधनं श्रेयः परधर्मो भयावहः ॥ इति । भगवद्गीता- ३/३५

स्वानुष्ठितपरधर्मापेक्षया स्वधर्म एव श्रेष्ठतमः । स्वधर्माचरणे मरणमपि भवतु उत्तममेव परं स्वभावविरुद्धं परधर्माचरणं तु भयास्स्पदं भवति ।

अन्नाद्भवन्ति भूतानि पर्जन्यादन्नसम्भवः ।

यज्ञाद्भवति पर्जन्यो यज्ञः कर्मसमुद्भवः ॥ इति । भगवद्गीता- ३/१४

अन्नात् प्राणिनः जायते, अन्नं पर्जन्यात् समुत्पद्यते । पर्जन्यः यज्ञाद्भवति यज्ञः कर्मणः समुद्भवति ।

वैज्ञानिकाः अपि यागाद्यनुष्ठानम् अत्यन्तं फलदायकमित्युच्यन्ते । यागाद्यनुष्ठानेन वृष्टिः, वातावरणनैर्मल्यं, इष्टसिद्धिश्च भवति ।

समाजे श्रेष्ठः ज्येष्ठः यद्यदाचरति इतरेऽपि तदेवाचरति । सः यत् प्रमाणमिति स्वीकरोति तदेव प्रमाणमिति सर्वेऽपि लोकाः अनुसरन्ति । मानवजीवनम् आदर्शमयं स्यादिति गीताचार्यः बोधयति । यतोहि तमेव अनुसरति अनुयायिणः । प्रपञ्चे आदर्शजीवनाय मनुष्य एक एव योग्यो भवति । युक्तायुक्तविलक्षणत्वात् । यथा-

यद्यदाचरति श्रेष्ठस्तत्तदेवेतरो जनः ।

स यत्प्रमाणं कुरुते लोकस्तदनुवर्तते ॥ इति । भगवद्गीता- ३/२१

अद्यतनकाले बहुत्र Communication Skillies इत्यस्मिन् कार्याशालाः निर्वहन्ति । परं गीतायां सम्प्रेषणोपायाः सुष्ठु प्रतिपादिताः । यथा –

अनुद्वेगकरं वाक्यं सत्यं प्रियहितं च यत् ।

स्वाध्यायाभ्यसनं चैव वाङ्मयं तपोच्यते ॥ इति । भगवद्गीता- १७/१५

आधुनिकसमाजे यान्त्रिकजीवने जितेन्द्रियाः मृग्याः एव भवन्ति । येषामिन्द्रियादीनां निग्रहः न भवति । तेषां तु स्थिरबुद्धिः नैव भवति । तेन सततम् उद्वेगः अनुभूयते । तद् निवारणार्थं गीतायाम् उपायमुक्तम् । यथा -



उद्धरेदात्मनात्मानात्मानामवसादयेत् ।

आत्मैव ह्यात्मनो बन्धुः आत्मैव रिपुरात्मनः ॥ इति ।

आत्मना आत्मानम् उद्धरेत् । आत्मानमात्मना न नाशयेत् यतः आत्मनः आत्मैव बन्धुः
आत्मनः आत्मैव रिपुश्च भवति । वस्तुतः स्वस्य उन्नतेर्वा अवनतेर्वा कारणं स्वयमेव
भवति ।

प्राच्यपाश्चात्यविद्वांसः महापुरुषाः भगवद्गीता एव सकलजीवकोटीनां परमतत्त्वार्थबोधिनी
इति मुक्तकण्ठम् उद्धोषयन्ति । गीतायाः विश्वप्रियत्वं कथयन् महर्षिः एवमुक्तवान् ।

भारतामृतं सर्वस्वं विष्णोर्वक्त्राद्विनिसृतम् ।

गीतागङ्गोदकं पीत्वा पुनर्जन्म न विद्यते ॥ इति ।



**AN INTERACTION EFFECT OF PRIVATE SCHOOL STUDENTS
MENTAL HEALTH, SCHOOL ADJUSTMENT AND HOME
ENVIRONMENT ON ACADEMIC ACHIEVEMENT IN GEOGRAPHY
AMONG SECONDARY SCHOOL STUDENTS**

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Abstract

The purpose of the study was to analyze independent and combined effects of variables viz., mental health (high and low), School adjustment (high and low) and Home environment (favorable and unfavorable) on Academic achievement in Geography. The sample of the present study includes 250 'Private School Students' studying in IX standard were drawn using stratified random sampling technique. Among the other things, the study revealed that, i) The Private school students with high mental health have more influence on Academic achievement in geography than the Private school students with low mental health in Geography. ii) The Private school students with high Mental health and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with high Mental health and unfavorable Home environment; iii) The Private school students with high Mental health, high School adjustment and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with high Mental health, high School adjustment and unfavorable Home environment.

Introduction

In the modern society, education is considered as an essential need of human beings besides food, clothing and shelter. It is the aggregate of all the process by which a person lives in the society. It has been recognized as the most important factor for human development which contributes to national progress attired to the globalization process. UNESCO has declared Education as a human right, which means, education is the right of the people living in a particular country and it is the duty of the government to make provisions for imparting education to the people living in that country. In order to achieve this aim of education as a human right, the primary education has been made free,



compulsory and universal as a first step in this direction. Progress in the field of education is measured mainly through academic performance. Quality of performance has become the key factor of personal progress. Parents desire that their children climb the ladder of performance to the highest level possible.

Their desire to achieve a high level of achievement from children put a lot of pressure on students, teachers and schools. A lot of time is devoted and efforts are made to enable students to achieve better scholastic endeavors.

Rationale for the Study

Gouri Sharma (2017) revealed that stress and academic achievement found to be significant positive association with each other. It is concluded that mental health condition of the students affect academic achievements. **Shashikala (2015)** found that high achiever group was mentally healthy than low achiever group. Mental health was positively related with academic achievement. **Thilagavathy (2014)** revealed that the student of different achievement groups (high, average and low) seems to possess different mental health. And also it is found that there is a positive and significant relationship between academic achievement and mental health. **Saroja Gudadur (2010)** Studied an effect of mental health, social adjustment and socio-economic status on academic achievement of secondary school students and revealed that i) Interaction effect of high and low mental health, high and low school social adjustment and high and low socio-economic status of IX standard students are not found significantly on total academic achievement and in school subjects; and ii) The girl students have high mental health and high school social adjustment than the boys students of IX standard. **Sohella and Seyed Mohammad (2015)** studied Self-Concept, Social Adjustment and Academic Achievement and found that there is a significant correlation between Academic achievement and Social adjustment. **George (1966)** studied comparative study of the adjustment and achievement of 10 years and 11 years schooling in Kerala state and found that, the pupils with high intelligence were identified as better adjusted and higher achievers in all the groups studied. **Chitra and Padma (2014)** studied the Impact of Home Environment on Academic Achievement and revealed that there is no significant difference between boys and girls in the impact of Home environment on their academic achievement. **Jansi and Bhuvaneshwara Lakshmi (2014)** studied the Influence of Self Concept and Home environment on the Academic achievement and revealed that relationship between self concept, study attitude and home environment will surely throw light on the academic performance of the students. **Ashvinkumar Soni (2013)** study the Relationship between Academic Achievement Motivation and Home environment and found that An academically favorable home environment is likely to enhance the child's



motivation to achieve academic success which in turn will contribute to good performance in school.

Objectives

The present study was designed with the following objectives in views:

1. To study the effect of Private school students' Mental health on Academic achievement in geography
2. To study the effect of Private school students' School adjustment on Academic achievement in geography
3. To study the effect of Private school students' Home environment on Academic achievement in geography
4. To study the interaction effect of Private school students' Mental health and School adjustment on Academic achievement in geography
5. To study the interaction effect of Private school students' Mental health and Home environment on Academic achievement in geography
6. To study the interaction effect of Private school students' School adjustment and Home environment on Academic achievement in geography
7. To study the interaction effect of Private school students' Mental health, School adjustment and Home environment on Academic achievement in geography.

Hypotheses

In pursuance of the objectives (1-7), the following null hypotheses were set up.

1. Effects of high and low mental health of Private school students differ significantly in terms of their influence on Academic achievement in geography.
2. Effects of high and low School adjustment of Private school students differ significantly in terms of their influence on Academic achievement in geography.
3. Effects of favourable and unfavourable Home environment of Private school students differ significantly in terms of their influence on Academic achievement in geography.
4. Interaction effects of Private school students' Mental health X School adjustment differ significantly in terms of their influence on Academic achievement in geography.
5. Interaction effects of Private school students' Mental health X Home environment differ significantly in terms of their influence on Academic achievement in geography.
6. Interaction effects of Private school students' School adjustment X Home environment differ significantly in terms of their influence on Academic achievement in geography.



7. Interaction effects of Private school students' Mental health X School adjustment X Home environment differ significantly in terms of their influence on Academic achievement in geography.

Research Design

Ex Post Facto research design was used in the present study (Kerlinger, 1964 p. 379). Ex Post Facto research is systematic empirical inquiry in which the investigator does not have direct control of independent variables because their manifestations have already occurred or because they are inherently not manipulatable. Inferences about relations among variables are made, without direct intervention, from concomitant variation of independent and dependent variables.

Method

Sample

The sample of the present study includes 250 'Private School Students' studying in IX standard were drawn using stratified random sampling technique. Among the Government and Private Secondary schools in Urban and Rural areas of Bijapur district forms the sample

Tools

The following tools were used to collect the essential data:

1. Mental Health Status Scale (MHSS) (1984) Developed by K.C.Baby prasanna and Mercy Abraham.
2. Adjustment Inventory for School Students (AISS) (2007) Developed by Sinha and Singh.
3. Home Environment Scale (HES)(2013)Developed by Aaliya Akthar and Shail Bala Saxena.
4. Academic Achievement in Geography was constructed by the investigator.

Procedure

Data relating to mental health, School adjustment, Home environment and Academic achievement in Geography were collected by administering the above tools to IX standard students studying in Bijapur district.

Results

The data were analyzed using 3 –way ANOVA technique with a view to identify independent and combined effect of selected variables on Academic Achievement. The results of the analysis are given in Tables 1 to 2.



Analysis of Data pertaining to ‘Private school students’

Table-1: Summary Table of ANOVA with Respect to ‘Private School Students’

Source of Variation	df	Sum of Squares	Mean of Sum of Squares	F Ratios	P - Value	Significance
Main effects						
Mental health (A)	1	8663.82	8663.82	233.2769	<0.01	S
School adjustment (B)	1	1138.55	1138.55	30.6558	<0.01	S
Home environment (C)	1	1972.21	1972.21	53.1025	<0.01	S
2 way interactions						
MH x SA (A x B)	1	219.38	219.38	5.9070	<0.01	S
MH x HE (A x C)	1	264.89	264.89	7.1322	<0.01	S
SA x HE (B x C)	1	187.25	187.25	5.0419	<0.01	S
3way interactions						
MH x SA X HE (A x B x C)	1	863.90	863.90	23.2609	<0.01	S
Error	242	8987.79	37.14			
Total	249	22297.79				

Findings

The analysis of the table -1 reveals the following

1. There is a significant difference between the effects of high and low mental health of Private school students in terms of their influence on Academic achievement in Geography.

However, the means of Mental health scores of Private school students with high and low Mental health are 55.53 and 41.74 respectively. The two means clearly reveals that the Private school students with high Mental health have a greater mean than that of the mean of the Private school students with low Mental health. Thus, it can be interpreted that the Private school students with high Mental health have more influence on Academic achievement in geography than the Private school students with low Mental health in Geography.

2. There is a significant difference between the effects of high and low School adjustment of Private school students in terms of their influence on Academic achievement in Geography.

However, the means of School adjustment scores of Private school students with high and low School adjustment are 53.57 and 45.01 respectively. The two means clearly reveals that the Private school students with high School adjustment have a greater mean than that of the mean of the Private school students with low School adjustment. Thus, it can be interpreted that the Private



school students with high School adjustment have more influence on Academic achievement in Geography than the Private school students with low School adjustment in Geography.

3. There is a significant difference between the effects of favorable and unfavorable Home environment of Private school students in terms of their influence on Academic achievement in Geography.

However, the means of Home environment scores of Private school students with favorable and unfavorable Home environment are 54.61 and 46.75 respectively. The two means clearly reveals that the Private school students with favorable Home environment have a greater mean than that of the mean of the Private school students with unfavorable Home environment. Thus, it can be interpreted that the Private school students with favorable home environment have more influence on Academic achievement in Geography than the Private school students with unfavorable Home environment in Geography.

4. There is significant difference between the interaction effects of high/low mental health and high/low School adjustment of Private school students in terms of their influence on Academic achievement in Geography.

5. There is a significant difference between the interaction effects of high/low mental health and favorable/unfavorable Home environment of Private school students in terms of their influence on Academic achievement in Geography.

6. There is a significant difference between the interaction effects of high/low School adjustment and favorable /unfavorable Home environment of Private school students in terms of their influence on Academic achievement in Geography.

7. There is a significant difference between the interaction effects of high/low mental health, high/low School adjustment and favorable/unfavorable Home environment of Private school students in terms of their influence on Academic achievement in Geography.

Multiple Comparisons of Means – ‘Private school students’

Scheffe’s simultaneous confidence intervals for all possible treatment groups pertaining to the Private school students are given below:



**Table -2 : Comparison of Means of Treatment Groups on
 ‘ Private School Students’ - Scheffe’s Simultaneous Confidence
 Intervals**

Sl. No	Comparison of treatment groups		Corresponding means		Simultaneous Confidence Intervals		P-value	Significance
1	a1 x b1	a1 x b2	57.92	50.29	5.55	9.71	<0.05	S
2	a1 x b1	a2 x b1	57.92	43.63	12.18	16.40	<0.05	S
3	a1 x b1	a2 x b2	57.92	40.04	15.84	19.92	<0.05	S
4	a1 x c1	a1 x c2	59.60	51.81	5.86	9.72	<0.05	S
5	a1 x c1	a2 x c1	59.60	44.50	12.67	17.53	<0.05	S
6	a1 x c1	a2 x c2	59.60	40.11	17.42	21.56	<0.05	S
7	a1 x b1 x c1	a1 x b1 x c2	59.82	55.67	1.81	6.49	<0.05	S
8	a1 x b1 x c1	a1 x b2 x c2	59.82	46.03	11.15	16.43	<0.05	S
9	a1 x b1 x c1	a2 x b1 x c1	59.82	48.05	8.67	14.87	<0.05	S
10	a1 x b1 x c1	a2 x b1 x c2	59.82	40.23	16.76	22.42	<0.05	S

Note:

1. Comparison of other treatment groups of Private school students were found to be not significant.
2. Higher the mean scores indicates higher influence of independent variables on dependent variable.

Table .2 reveals the following:

1. The Private school students with high Mental health and high School adjustment have more influence on Academic achievement in Geography than the Private school students with high Mental health and low School adjustment.
2. The Private school students with high Mental health and high School adjustment have more influence on Academic achievement in Geography than the Private school students with low Mental health and high School adjustment.
3. The Private school students with high Mental health and high School adjustment have more influence on Academic achievement in Geography than the Private school students with low Mental health and low School adjustment.
4. The Private school students with high Mental health and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with high Mental health and unfavorable Home environment.
5. The Private school students with high Mental health and favorable Home environment have more influence on Academic achievement in Geography



than the Private school students with low Mental health and favorable Home environment.

6. The Private school students with high Mental health and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with low Mental health and unfavorable Home environment.
7. The Private school students with high Mental health, high School adjustment and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with high Mental health, high School adjustment and unfavorable Home environment.
8. The Private school students with high Mental health, high School adjustment and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with high Mental health, low School adjustment and unfavorable Home environment.
9. The Private school students with high Mental health, high School adjustment and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with low Mental health, high School adjustment and favorable Home environment.
10. The Private school students with high Mental health, high School adjustment and favorable Home environment have more influence on Academic achievement in Geography than the Private school students with low Mental health, high School adjustment and unfavorable Home environment.

Discussion and Conclusions

1. In the present study the researcher hypothesized that Private school students with high and low Mental health differs significantly in-terms of their effects on Academic achievement in Geography. Findings of the study clearly revealed that students with high Mental health have more influence on Academic achievement in Geography than the students with low Mental health this may due to the reason that, Mentally healthy person is self acceptant and has reasonably high self-esteem, feels generally adequate, but recognizes his own short comings and seeks to improve, is well balanced, flexible and consistent in his attitudes, goals and deals attempts to solve his problems, rather than to escape them or to employ defense mechanisms excessively. These characteristics help in higher achievement.
2. In the present study, the researcher hypothesized that the students with high and low school adjustment differ significantly in terms of their effects on academic achievement in geography. Findings of the study clearly reveal that students with high school adjustment have more influence on the achievement in science than the students with low school adjustment. This may be ascribed to the following reasons; Students well adjusted to school



have characteristics of overcoming blocks, reading goals, satisfying motives, relieving frustration and maintaining equilibrium and has own mechanism of maintaining balance in his personality.

3. In the present study the researcher hypothesized that student with favorable and unfavorable Home environment differs significantly in-terms of their effects on Academic achievement in Geography. Findings of the study clearly revealed that students with favorable Home environment have more influence on Academic achievement in Geography than the students with unfavorable Home environment. This may be due to that, i) teaching and supervision of the students works at home by parents; ii) enrolment of students with good school; ii) the existence of coordinational relationship love and care in the students family; iii) the academic level of students parents; iv) Siblings and peer group influence at home and provisions of modern electrical gadgets at home like television, radio, home videos, tape recorders and computer system.

Educational Implications

The latest thinking regarding education is that it is essentially a process of human resources development. It can be achieved only by promoting mental health of the students; mental health should be the primary education goal.

i) Co-curricular activities should be given importance to promote the mental health of students; ii) Adequate services of expert consultants and psychologists, psychiatrists, psychiatric social workers, visiting teachers, guidance clinics should be provided; iii) There should be improvement in the working conditions of teachers and the environment for students should be conducive to good mental health; iv) Teachers should help students to develop rationality, curiosity, open-mindedness, personal confidence, aversion to superstition, intellectual belief, suspended judgment etc, as these variables are good predictors of achievement of science students.

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SIMPLIFIED DIGITAL WAVES AND SINUSOIDAL PULSE WIDTH MODULATION FOR SINGLE PHASE INVERTER

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Abstract - Applications need kinds of waveforms to drive devices of different properties. Such waveforms need to be generated and translated to get interfaced and form the way they are faithfully received by the target device. Basic and natural waves are most used. Electronic active elements have their own properties and most of the time they are not designed for the application. Generic nature of these active elements needs to be transformed for the utility. One such is Power MOSFET. It cannot Power transfer a linear signal but only Power switch a load. In such conditions signal or wave needs to be converted to wave weighted Pulse Width Modulation. Thus, developed PWM needs to be controlled by width to effect control voltage keeping intact the frequency and harmonics to minimum. Attempts to reduce footprint of this solution is a continuous strive in the industry. This is a general application in UPS and Inverters were signals need to be transformed to pulse width. Generation of Controlled switching pulses in the name of SPWM is an aim and attempt for the industry.

Key Words: SPWM, MOSFET, Total Harmonic Distortion (THD), MOSFET Full Bridge, Comparator, 50HZ, Switching frequency.

1.Introduction

Mathematics behind producing an analogue signal digitally is the aim here. Constructing required signal digitally requires an addressable memory were signal data is stored or a microcontroller is needed to port out other required signals along with. A very general way is porting out signal weighted digital data on to the port lines parallelly. Application of such kind of digital signals root into designing of UPS or a Power inverter. Digital way of producing an analogue signal gives accuracy in frequency, accuracy in fixing amplitude and precise feedback control is achieved. Digital feedback correction is faster giving tight regulation. Digital signal produced cannot be used to switch the power need of the application. Power inverters to produce sine wave and all the power source parameter needs of the general electrical loads, are initially ported out from a digital device or microcontroller. Usually it is sine wave used for power inverter applications. In various another



applications Cos wave is desired which is used for signal processing. Both the applications are unique and do not match into one single hardware. This paper talks about producing sine wave, cos wave and sine wave converted into Sine weighted Pulse Width Modulation (SPWM). Anyhow converting sine wave to SPWM goes in hardware method and the other in software method. Feedback to control the amplitude also goes with hardware method and software method. In any of these, production of sine wave is by look up table and use a low-end microcontroller which embeds feedback within. A projection into another unique method which goes with a calculated SPWM with respect to feedback is fuzzy logic applied in calculating the feedback error and correcting the SPWM. This would exclusively occupy a separate paper.

2.Digital way of Generating Sine Wave

Sine wave required for power inverter application is of 50Hz which denotes to be of 20mS of time for one cycle. There are two half waves each comprising of 10mS each. A train of such 10mS waves would serve the purpose. 180° of the wave takes half cycle and is repeated.[1]

0° to 180° is divided into 256 parts. Each part angle = $180^\circ / 256 = 0.703125^\circ$

Maximum amplitude of the waveform $V_m = 5V$

Generally, $V = V_m (\sin \Theta)$

Amplitude at $\Theta = 0.703125^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 0.703125)$$

$$V = 0.06135 V$$

5V max corresponds to HEX value 0FFH

$$V \text{ corresponds to HEX data} = (0.06135 \times 256) / 5$$

$$= 3.1415$$

$$= 003H$$

Amplitude at $\Theta = 1.40625^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 1.40625)$$

$$V = 0.1227061 V$$

$$V \text{ corresponds to HEX data} = (0.1227061 \times 256) / 5$$

$$= 6.28255$$

$$= 006H$$

Amplitude at $\Theta = 2.109375^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 2.109375)$$

$$V = 0.1840361 V$$

$$V \text{ corresponds to HEX data} = (0.1840361 \times 256) / 5$$

$$= 9.422$$

$$= 009H$$

Amplitude at $\Theta = 2.8125^\circ$ will be
 $V = V_m (\sin \Theta)$



$$V = 5 (\sin 2.8125)$$

$$V = 0.24533 \text{ V}$$

V corresponds to HEX data =
 $(0.24533 \times 256) / 5$

$$= 12.5613$$

$$= 00CH$$

Amplitude at $\Theta = 84.375^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 84.375)$$

$$V = 4.9759 \text{ V}$$

V corresponds to HEX data =
 $(4.9759 \times 256) / 5$

$$= 254.76729$$

$$= 0FEH$$

Amplitude at $\Theta = 90^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 90)$$

$$V = 5.000 \text{ V}$$

V corresponds to HEX data =
 $(5.000 \times 256) / 5$

$$= 256$$

$$= 0FFH$$

Amplitude at $\Theta = 180^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5 (\sin 180)$$

$$V = 0.000 \text{ V}$$

V corresponds to HEX data =
 $(0.000 \times 256) / 5$

$$= 0.000$$

$$= 000H$$

Amplitude at $\Theta = 0^\circ$ will be
 $V = V_m (\sin \Theta)$

$$V = 5$$

$$(\sin 0)$$

$$V = 0.000 \text{ V}$$

V corresponds to HEX data =
 $(0.000 \times 256) / 5$

$$= 0.000$$

$$= 000H$$

HEX values for all the 256 angles is derived and listed.

This list is sine weighted data to be loaded in the PWM register of the controller. This loading takes place for all the 256 Values in 10mS time period. It is repeated and continued.

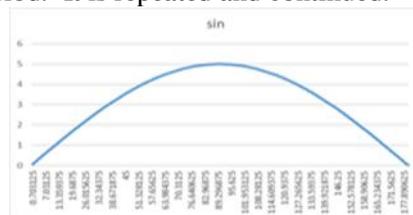


Fig.1 180° Sine wave in 256 parts

Fig.1 illustrates the sine wave constructed with the data derived from the calculations for all the 256 parts of angles from 0° to 180° . [1]

As an academic view and to observe the effect of electrical signal for Cos is calculated as done for Sine.

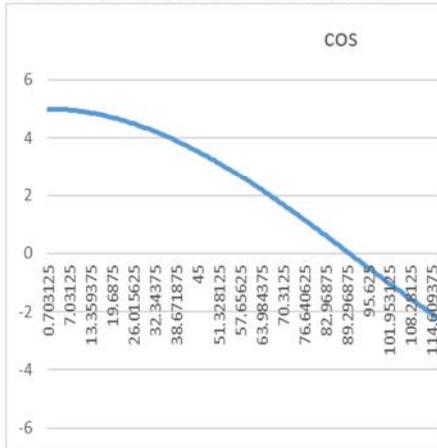


Fig.2 180° Cos wave in 256 parts

Fig.2 Illustrates the Cos wave constructed with the data derived from the calculations for all the 256 parts of angles from 0° to 180° [1].

3.CLOCKING OUT SINE WEIGHTED 8 BIT DATA

Since calculations are made using a base of 256 parts of 180° it is clear that it's an 8-bit data of each sine weighted value of the wave.

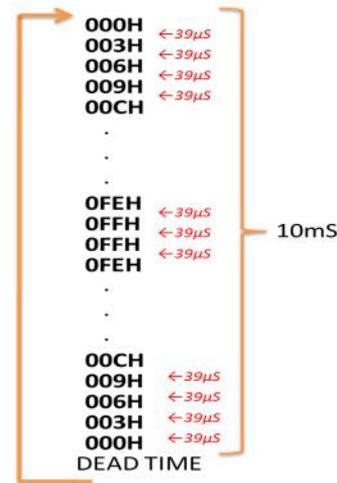


Fig.3 Parallel 8 Bit data ported out with time space

Fig.3 Illustrates Parallel 8-bit data ported out from the device in sequence and a time gap of 39 microseconds each. This counts to be 10mS to complete 256 data making 180 degrees and half sine wave. This is repeated with a small dead time introduced between each wave. In 39 microseconds of each data out, a modulation carrier frequency of 12.8KHz is generated.

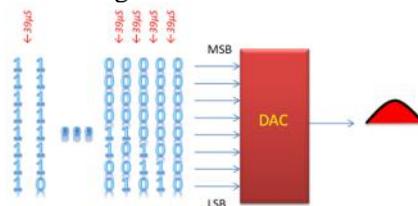


Fig.4 8 Bit data converted to Analogue data

Fig.4 illustrates Digital to analogue conversion to form half sine wave. DAC is a passive component network introducing no time lapse in

conversion. Active devices can be used but that depends on the necessity. A projection of gain-controlled DAC can be made. Programming the gain while in operation is a scope which can be considered in designs. Programmability of gain can work as feedback control.

4. Triangular Wave Generation

Generation of sine wave using digital method is one step ahead of the desired SPWM testing. Generation of SPWM is the target to witness the quality of digital signal produced by mathematically handling the bits.

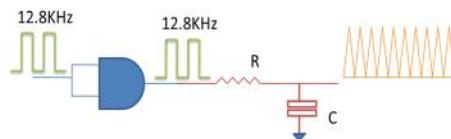


Fig.5 Square wave to Triangular wave

Fig.5 illustrates Square wave to triangular wave conversion. 12.8KHz of digital wave is produced by a digital device or microcontroller. This is a switching frequency desired to produce SPWM from half sine wave. The square wave is ANDed through a gate to port out on a totem pole output of the gate. Totem pole is required to source and sink the signal. This aids in charging and discharging through a current limiting resistor. Timing elements R and C define the charging and discharging time of the signal resulting in a triangular wave. This way of developing triangular wave gets encountered with a problem of shifting above the ground at higher frequency and needs a negative supply to pull it

down to ground level [3]. This is always a bug bear with respect to minimising component count and added power consumption. Certainly, a solution exists in developing a triangular wave without passive timing elements which will be talked in further sections of the paper. Triangular wave plays a vital role in controlling Total Harmonic Distortion of the Power converter system [2].

5. Sine Wave Pwm Generation

Superimposed waves of sine wave and triangular wave gives a result. That can be realized by comparing the two signals. Sine wave of 100 Hz is compared using a fast comparator with a triangular wave of the frequency 12.8KHz.

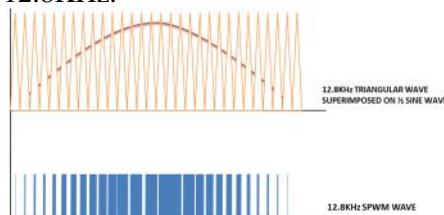


Fig.6 Sine wave superimposed with triangular wave

Fig.6 Illustrates and indicates sine wave superimposed with triangular high frequency. It is clearly observed that Pulse width of the SPWM signal ported out have pulse widths starting with a narrow ON time and as it goes to the centre of the wave, the ON time drastically increases. Again, reduces in the next part of the wave till the reach of 180°. Novel methods in generation of such SPWM train of pulses are proposed

but the industry is keen on using a simpler and a solution bearing low component count [6].

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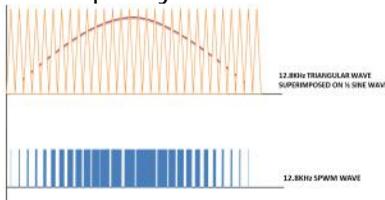


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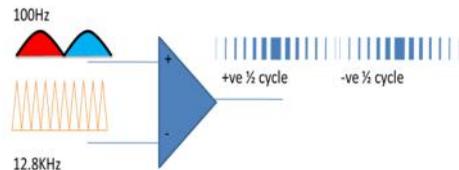


Fig.7 100Hz Sine and 12.8KHz Triangular wave compared

Fig.7 Illustrates comparison of Train of half sine waves signals and triangular wave signals effectively generating logical High Low signals. Non-Inverting terminal and inverting inputs are respectively fed with sine wave and triangular wave. A continuous track of comparison of these signals deliver a PWM. At any time period of the train of signal waves compared gives out High or Low depending on amplitudes of sine and triangular waves compared with each other. This when observed for 20 mS a +Ve and -Ve cycles analogy is observed in SPWM.

7.Sync Separation and Spwm Gating

Digital steering of SPWM signals to drive power devices at digital stage establishes efficiency in the solution. A 100Hz signal synchronised to the train of sine wave signals is produced. This is called 100Hz Sync. A sync separator porting out Non inverted and Inverted sync signals is done by a dedicated digital circuit.

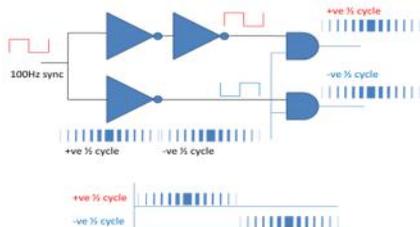


Fig.8 Digital Steering of +ve half cycle and -ve half cycle

From Fig.8 100 Hz Sync signal is put on to NOT gates and in turn logic gated through AND gates. Sync signal gets inverted into one channel and the other channel intact and in phase with sync signal. These two play the role of gating signals to AND gates on each. The other inputs to the AND gates in common are ported with train of SPWM signal. The gating sync signals in phase and out of phase of the sync signal steer the SPWM into two channels. These are defined as upper half and lower half in the general analogy.

8.Required Signals

Signals required to confirm the performance of SPWM is Sine Wave, Sync Signal and Triangular Wave. The mathematics and physics of the signals are engineered to a shape in previous topics of this paper. To realise all these signals and switch the power devices to deliver electrical load, signals can be produced in three different ways. Digital Method, Microcontroller Method and DSP Microcontroller Method.

Digital Method:

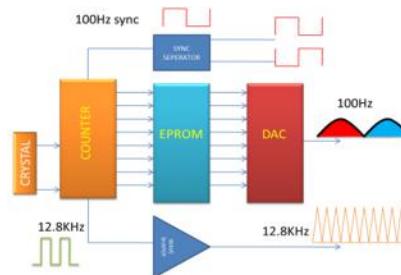


Fig.9 Digital porting of signals

Fig.9 Illustrates discrete digital components wired around to produce required signals. Crystal operated counter addresses EEPROM from 00H to FFH were Sine Weighted digital data is stored. At each address of the counter, sine weighted data gets ported out on to a DAC through which the data gets converted into analogue signal which is a train of half sine waves. Along with this the counter is timed to produce 100Hz sync signal going low to high at counter 00H count and at FFH going to logic high to low. Sync signal is split into two signals. One in phase with the original sync signal and the inverse to the original. This is done with a digital element employed exclusively for. A 12.8KHz signal is also generated along with other two functions. This is shaped to triangular wave using exclusively wired around to time the signal to form triangular wave. These signals require a further device to extract SPWM and SPWM gating signals.

Microcontroller Method:

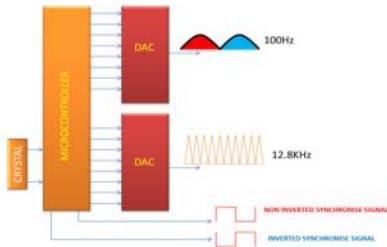


Fig.10 Microcontroller porting of signals

Fig.10 Illustrates a microcontroller employed to port out required signals through a minimum hardware compared to the digital method. Two 8-bit ports are employed to produce 8-bit parallel sine weighted signal and the other port for triangular wave from a triangular weighted digital data. Similarly, sync signal separated to inverted and non-inverted signals are ported out. These signals require a further device to extract SPWM and SPWM gating signals.

DSP Microcontroller Method:

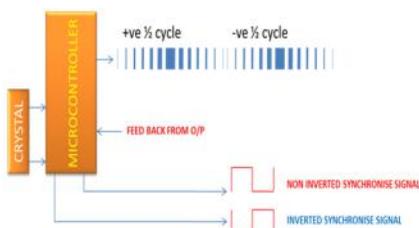


Fig.11 DSP Microcontroller porting out signals

Fig.11 Illustrates a DSP microcontroller for porting out signals. In fact, the signals are processed enough minimizing the hardware so that they are directly used to interface

to the Power switching driver. The controller ports out SPWM train of pulses from one port pin. Inverted sync signal and non-inverted sync signal from another pin are ported out. These are at logic levels of 5V. Apart from these signals output voltage feedback is fed to the controller to regulate and wave shape at each levels of sine wave. DSP plays a vital role in shaping the output loaded sine wave because of its fast ADC and fast processing instructions.

9.Spwm at Full Bridge

Inverters can be configured in multiple ways as Multilevel, Half Bridge and Full Bridge [4]. For the application of single-phase inverters or UPS Full bridge converter is most efficient and faithful enough generating near to natural Sine Wave.

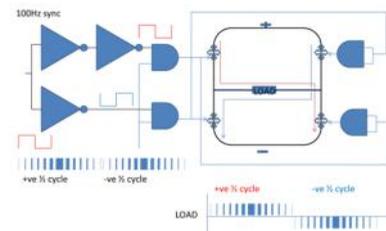


Fig.12 SPWM steering and switching

Fig.12 Illustrates steering of half sine weighted SPWM pulses to Power devices full bridge. Power devices driver is not indicated in the illustration but need to be driven through a driver. Driven SPWM pulses land on diagonal power devices [5]. 10mS of time to each of pulse train. This switches load which is generally a transformer. Load

switching is observed in the same fig which goes upper half and lower half as the usual analogy.

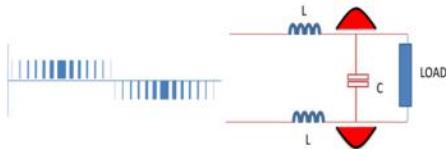


Fig.13 Filtering the SPWM

Fig.13 Illustrates filtering the high voltage SPWM pulses to form a full Sine wave. LC filtering tuned to the switching frequency of 12.8KHz shapes the pulses to form a pure Sine wave [5].

10. Conclusion

Digitally produced SPWM or Microcontroller Produced SPWM results out the same needed Sine wave at the load across the Full bridge. What differs is in the hardware and the hardware needs to reach the ultimate result. In digital method and Microcontroller method a negative supply is required only to bias the triangular wave to shift it down to ground. This is not an issue when it is DSP Microcontroller.

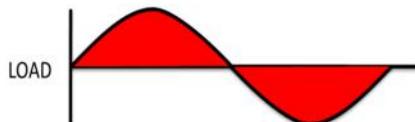


Fig.14 Filtered True Sine Wave across load

Fig.14 illustrates True Sine wave across load. Filtered SPWM pulses form to be a pure sine wave. The feedback in any method plays a role to

shape the waveform and regulate the output voltage.

THD of the AC Power delivered to the load is within range of less than 3%. This is possible because of construction of a seamless digitized sine wave and controlled with a feedback [2].

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Acknowledgements

This is a topic which I have been embedding into my designs from 2 decades. It has gone into various designs and capacities of inverters and UPS systems. Myself and my son P.Suryanarayana Reddy dedicate this technique to my Father Late Prof P.Surya Narayana Reddy who has incepted technical thoughts in me. And also dedicate to my first schoolteacher Late Sree S.S.Betgeri who has carved my technical thoughts to realization.

Obeisance:

I wish to convey obeisance to my teachers who have continually updated me with the present trends in the technology and carved my technical thoughts over a period.

1. B.B.Nagnur
2. Dr.M.B.Kothle
3. Prof.Kudleppanavar
4. Dr.P.P.Shaha
5. Dr.R.R.Mudholkar
6. Dr.R.K.Kamath
7. Dr.S.A.Deoskar
8. Dr.S.S.Ghaisas

In chronological order of seeking their blessings.

Biographies



P.Chow Reddy, 20 Years of experience in Product development and in the fields of Embedded systems, Power electronics and soft computing.



P.Surya Narayana Reddy, Research and Development experienced into Soft computing, Mathematical evaluation and conceptualization of products.



DEVELOPMENT OF REGIONAL RURAL BANKS IN INDIA

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Introduction

Regional Rural Banks are governed by the RBI's Act, 1976, Banking Regulation Act 1949 and guidelines of RBI and NABARD and sponsor Bank. The RRBs have been working since 2006 in India. These Banks are very much accessible to people living in Rural India. RRBs also performing almost similar functions that are being performed by the Commercial Banks.

The general management and the Business affairs of RRBs are vested with the Board of directors of RRBs. In this paper the aim of the researcher is to furnish the details pertaining to progress in the mobilization of deposits, extending loans and advances, investments and accumulation of profits of RRBs over a study period of ten years. The key problem of agriculture, carried on in rural areas mostly by poor, small and marginal farmers and weaker section of the society, is credit. Credit is one of the critical inputs for agricultural development. Bank credit is available to the farmers in the form of short-term credit for financing crop production programs and in the form of medium-term/long-term credit for financing capital investment in agriculture and allied activities like land development including purchase of land, minor irrigation, farm mechanization, dairy development, poultry, animal husbandry, fisheries, plantation, and horticulture.

Loans are also available for storage, processing and marketing of agricultural produce. The credit needs of the farmers are of three kinds. Firstly, farmers need short term credit to finance agricultural operations like purchase of seeds, pesticides and fertilizers. Secondly, farmers need medium term credit for purpose of ploughing, back the money purchase of agricultural equipments, tractors and other implements to cultivate their lands with the help of modern implements. Thirdly, farmers need credit for long-term agricultural development such as development of land, construction of boundaries and horticulture.

United Nations publications have stressed the need for credit to farmers. These reports observed that most of the farmers in the world have to borrow for



cultivation; that many of them borrow heavily to raise agricultural production and some desire to borrow still more. And more credit amount is almost always needed. The need of credit for agriculture can hardly be over emphasized where its productivity is still low due to financial constraints.

In this context, All Rural Credit Survey has observed: “Agricultural credit is a problem when it cannot be obtained; it is also a problem when it can be had but in such a form that on the whole it does more harm than good. In India it is this twofold problem of inadequacy and unsuitability that is perennially presented by agricultural credit”. Undoubtedly, an Indian farmer is not able to make the maximum use of his time, labour and productive capacity of his land because of the lack of adequate financial facilities.

Review of Literature

Joshi Mohichand (1982), in his article entitled “Regional Rural Bank: An Analytical Study” observed that the supervision and monitoring of credit by RRBs had not been accompanied by corresponding improvement of their financial viability. He also said that there is every possibility of domination of RRBs by affluent. Moreover, he suggested that banking activities should be carried out on wider contest. As friend, philosopher and guide of the rural people of advice the functionaries in RRBs that they should try to understand the people problems in a sympathetic manner in the process of rural welfare and provide loans accordingly.

Jaynal Uddin Ahmed., (2013), in his article entitled “Performance evolution of Regional Rural Banks: finance from Indian Rural Banks” has examined that the genesis of the Regional Rural Banks (RRBs) for around three and half decades can be traced to the need for stronger institutional arrangements for providing rural credit. The inception of RRBs can be seen as a unique experiment as well as experience in improving the efficacy of rural credit delivery mechanism in India in the rural deposits as reflected from the increase in deposit per branch and also the loans per branch of RRB.

Huma Naz and Sarita Parihar, (2014) in their article entitled “Role of Regional Rural Banks in Jammu and Kashmir” The establishment of the Regional Rural Banks has been the landmark in the history of rural banking. This research is based on the role of banks in providing facilities and sources to India backwardness and its farmers. Prior to Regional Rural Banks, commercial banks and co-operatives were active in the disbursement of rural credit. But they were not able to meet the credit requirements in the rural areas. Economic Development of our country can



be achieved only through the uplift of the village folk. Among the various institutional agencies engaged in rural finance, Regional Rural Banks (RRBs) play a significant role in financing the target groups in rural sector.

Mukesh Tagariya B., Pritesh Panchal C. (2016) in their article entitled “A Conceptual Study on The role of Regional Rural Banks in India” Stated that the Regional Rural Banks in India are an integral part of the rural credit structure of the country. Since very beginning, (2nd October 1975) the Regional Rural Banks played a pivotal role in the economic development of the rural India. The main goal of establishing regional rural banks in India was to provide credit to the rural people who are not economically strong enough, especially the small and marginal farmers, artisans, agricultural labourers, and even small entrepreneurs. In this paper an attempt in made to present the conceptual study about the role of Regional Rural Bank in India and its performance indicators for last nine years from 2007 to 2015.

Objectives of the Study

The primary objective of the study is to assess the development of Regional Rural Banks in India.

Methodology

For the preparation of this research paper the researcher has collected time series data from the financial reports of SGB, NABARD, RBI and the like for the time period of ten years from 2007-08 to 2016-17. The data so collected were put in the form of tables. Analysis was made for each of the table so as draw the relevant inferences.

Growth of Regional Rural Banks in India in Term of Branch Expansion

Number of Regional rural Banks and their branch network plays an important role in improvising the performance of RRBs. Availability of Bank branch is considered as one of the most important channels of the bank and generally the most preferred channel of a customer. Hence it is needed to make an effort by the banks to expand their branch network to provide an equal opportunity to all the users of bank services. The information relating to growth and coverage of Regional rural Banks in India is presented in Table-1



Table: 1
Development of RRBs in respect of their Expansion of Branch network over the ten year period from 2008-2017

S. No.	Year	No. of RRBs	Growth in the no. of RRBs	No. of Branches	Growth in the no. of Branches	No. of Districts covered	Growth in the no. of Districts covered
1.	2007-08	91	-	14,761	-	594	-
2.	2008-09	86	-5.49	15,181	2.84	617	3.87
3.	2009-10	82	-4.65	15,480	1.96	618	0.16
4.	2010-11	82	0	16,001	3.36	620	0.32
5.	2011-12	82	0	16,909	5.67	638	2.90
6.	2012-13	64	-21.95	17,861	5.63	635	0.47
7.	2013-14	57	-10.94	19,082	6.84	642	1.10
8.	2014-15	56	-1.75	20,024	4.94	642	0
9.	2015-16	56	0	20,920	4.47	644	0.31
10	2016-17	56	0	21,422	2.40	648	0.62

Source: Annual Reports of NABARD, Key Indicators of RRBs from 2008-2017

Table 1 depicts the distribution of number of RRBs and their branch number over different districts and years and their growth over the ten year study period from 2007-08 to 2016-17 in terms of number of RRBs, number of branches and number of districts. The number of RRBs decreased from 2007-08 to 2016-17. Number of RRBs in 2007-08 was 91 and decreased to 56 in 2014-15 and remained unchanged from 2015-16 to 2016-17. The growth in the number of RRBs over the ten year period of study is not impressive. Rather it is zero for some years and negative in other years. The progress in the RRBs in terms of number is not impressive for the study period under consideration. It is surprising to notice that there is tremendous growth in the number of branches of RRBs over the ten year study period from 2007-08 to 2016-17. Though there is a stunted growth in the number of Banks (RRBs) their branch number rapidly increased from year to year. The RRBs branches in India were 14,761 in 2007-08 and increased to 21,422 in 2016-17. But their growth from year to year is not much impressive. The growth in the branch number showed a down trend from 2007-08 to 2009-10 and from 2012-13 to 2016-17 except from 2012-13 to 2013-14 wherein the growth in the number of bank branches showed an upward trend. The progress in the number of bank branches of RRBs in absolute terms is much impressive. But the growth in the number of Bank branches of RRBs in percentage terms is not impressive. The spread of Bank branches in districts is also progressive for the study period from 2007-08 to 2016-17.

From the foregoing analysis one can infer that the RRBs number decreased from 91 (2007-08) to 82 (2009-10). There is no change in the RRBs number in 2010-11 and 2011-12. Again the RRBs number decreased to 64 in 2012-13 and continued to decrease and reached 56 in 2014-15 and remained constant till 2016-17. The growth in the RRBs number is not impressive. The



number of branches of RRBs continuously increased for the entire study period of ten years. The growth in the number of branches is not consistent. The districts covered by RRBs increased for a maximum period of ten years. But the growth in the district covered by RRBs is not much impressive.

Deposit Mobilization of RRBs Deposit Mobilization is one of the crucial functions of RRBs. Continuous and adequate amount of deposit mobilization will help the banks discharge their function of lending and investment on which the prosperity of the bank depends. The bank should design proper deposit mobilization strategy which is the primary source of lending activities of the bank. The information relating to deposit mobilization of Regional Rural Banks is given in Table- 2

Table: 2

Development of RRBs in terms of the Mobilization of Deposits from 2008-2017

(Rs. In Crores)

S. No.	Year	Deposits	Growth in the deposits	Number of Branches	Deposits Per Branch	Growth in the deposits Per branch
1.	2007-08	99,093.46	-	14,761	6.71	-
2.	2008-09	1,20,189.90	21.29	15,181	7.92	18.03
3.	2009-10	1,42,980.48	18.96	15,480	9.24	16.67
4.	2010-11	1,66,232.34	16.26	16,001	10.39	12.45
5.	2011-12	1,86,336.07	12.09	16,909	10.02	-3.56
6.	2012-13	2,11,457.80	13.48	17,861	11.84	18.16
7.	2013-14	2,39,494.00	13.26	19,082	12.55	6.00
8.	2014-15	2,71,329.00	13.29	20,024	13.55	7.97
9.	2015-16	3,15,048.00	16.11	20,920	15.06	11.14
10.	2016-17	3,71,910.00	18.05	21,422	17.36	15.27

Source: Annual Reports of NABARD, Key Indicators of RRBs from 2008-2017

Table 2 shows an increase or decrease in the deposits mobilized in absolute terms, growth in the mobilization of deposits in percentage terms, number of branches, deposits mobilized by each of the branch and the growth in the deposits per branch over the ten year period from 2007-08 to 2016-17. The deposits of RRBs increased continuously from 2007-08 to 2016-17. But the growth in the deposits mobilized by RRBs is not consistent. There is a downward trend in the growth of the deposits mobilized from 2008-09 to 2011-12 and fluctuated from 2012-13 to 2013-14. But an upward trend is observed from 2014-15 to 2016-17. The number of branches of RRBs increased from 2007-08 to 2016-17. The increase in the branch number is continuous from 2007-08 to 2016-17. The deposits per branch of RRBs also increased from 2007-08 to 2016-17 except in 2011-12. The growth in the deposits of RRBs per branch over the ten year period is not significant and satisfactory.



From the foregoing analysis one can infer that the deposits of RRBs substantially increased from year to year for the entire study period of ten years from 2007-08 to 2016-17. But the growth in the deposits of RRBs is not impressive. Rather it declined from 2008-09 to 2011-12. The growth in the deposits of RRBs increased from 2014-15 to 2016-17. RRBs branches increased continuously. The deposits per branch of RRBs also increased significantly over ten year study period except in 2011-12. But the growth in the deposits per branch of RRBs is not impressive in the beginning of the first five years of ten year study period. But in the later period of four years of the same ten year study period the growth in the deposits per branch of RRB is impressive.

Table: 3
Development of RRBs in terms of Loans and Advances extended by their over ten year period from 2008-2017

(Rs. In Crores)

S. No.	Year	Loans and Advances	Growth in the loans and advances	Number of Branches	Advances Per Branch	Growth in the advances Per branch
1.	2007-08	58,984.27	-	14,761	4.00	-
2.	2008-09	67,802.10	14.95	15,181	4.47	11.75
3.	2009-10	82,221.59	21.27	15,480	5.31	18.79
4.	2010-11	98,917.43	20.31	16,001	6.18	16.38
5.	2011-12	1,16,384.97	17.66	16,909	6.88	11.33
6.	2012-13	1,39,837.00	20.15	17,861	7.83	13.81
7.	2013-14	1,59,660.00	14.18	19,082	8.37	6.90
8.	2014-15	1,80,955.00	13.34	20,024	9.04	8.00
9.	2015-16	2,06,538.00	14.14	20,920	9.87	9.18
10.	2016-17	2,26,175.00	9.51	21,422	10.56	6.99

Source: Annual Reports of NABARD, Key Indicators of RRBs from 2008-2017

Table 3 shows an increase and decrease in the loans and advances extended by RRBs to various sectors of the economy through innumerable number of branches and the amount extended by each of the branches over the ten year study period from 2007-08 to 2016-17. The loans and advances extended by RRBs in the country as a whole indicate that there is a continuous increase in the loans and advances extended by RRBs. But the growth in the loans and advances extended by RRBs is not steady. An upward trend is observed in the growth of the loans and advances extended by RRBs from 2008-09 to 2009-10. The number of branches of RRBs increased continuously from 2007-08 to 2016-17. The advances per branch of RRBs also increased from 2007-08 to 2016-17. But the growth in the advances per branch of RRB for the study period is not steady.



From the foregoing analysis one can infer that the loans and advances extended by all the branches and the loans and advances extended by each branch of RRB for the study period from 2007-08 to 2016-17 in absolute terms increased continuously. But the trend in the growth of loans and advances extended by each of the RRBs branches is not continuous and steady.

Table: 4

Growth and development of RRBs in terms of their Investment in India over ten year period from 2008-2017

(Rs. In Crores)

S. No.	Year	Investments	Increase in the investments of the current year over its previous year	Growth in the investments of the current year over its previous year
1.	2007-08	48,559.54	-	-
2.	2008-09	65,909.92	17,350.38	35.73
3.	2009-10	76,167.29	10,257.37	15.56
4.	2010-11	86,510.44	10,343.15	13.58
5.	2011-12	95,974.93	9,464.49	10.94
6.	2012-13	1,10,683.47	14,708.54	15.33
7.	2013-14	1,39,631.00	28,947.53	26.15
8.	2014-15	1,06,780.00	-32,851.00	-23.53
9.	2015-16	1,69,592.00	62,812.00	58.82
10.	2016-17	2,10,984.00	41,392.00	24.41

Source: Annual Reports of NABARD, Key Indicators of RRBs from 2008-2017

Table 4 depicts an increase or decrease in the investments of RRBs in absolute terms over the ten year period from 2007-08 to 2016-17 and the growth in the investments of RRBs in percentage terms for the same period of study is not steady. The investments of RRBs increased continuously from 2007-08 to 2016-17 except in 2014-15. During that year the investments of RRBs in absolute terms decreased when compared to the previous year. The increase in the investments of RRBs year on year is significant. For example the increase in the investment of RRBs in 2008-09 over its previous years is very much significant. The growth in the investments of RRBs showed a declining trend from 2007-08 to 2011-12 and an increased trend from 2012-13 to 2015-16 except in 2014-15 wherein the growth in the investments of RRBs is negative and declined in 2016-17. The increase in the investment of RRBs in the current year over its previous year is positive in all the years for the entire study period of ten years except in 2014-15.

From the foregoing analysis one can infer that the investments of RRBs in absolute terms increased from 2007-08 to 2016-17 except in 2014-15 when the investments of RRBs decreased considerably. The increase in the investments of RRBs in the current year is much higher than the investment in its previous years



except in 2014-15. But the growth in the investment of RRBs showed a declining trend from 2008-09 to 2011-12 and thereafter it fluctuated.

Table: 5

Performance of RRBs in India in attaining Profits over ten year period from 2008-2017

(Rs. In Crores)

S. No	Year	No. of RRBs	RRBs in profit	Amount of profit	RRBs in Loss	Amount of Loss	Net profit	Growth in the net profit
1.	2007-08	91	82	1383.69	8	55.58	1328.11	-
2.	2008-09	86	80	1823.55	6	35.91	1787.64	34.60
3.	2009-10	82	78	2550.51	4	8.44	2542.07	42.20
4.	2010-11	82	75	1785.87	7	71.32	1714.55	-32.55
5.	2011-12	82	79	1886.15	3	28.87	1857.28	8.32
6.	2012-13	64	63	2384.59	1	2.07	2382.52	28.28
7.	2013-14	57	57	2,694	0	0	2694.00	13.07
8.	2014-15	56	51	2,958	5	177	2781.00	3.23
9.	2015-16	56	50	2,206	6	188	2018.00	-27.44
10.	2016-17	56	49	2,604	7	387	2218.00	9.91

Source: Annual Reports of NABARD, Key Indicators of RRBs from 2008-2017

Table 5 depicts the progress of RRBs in terms of number of RRBs which are running on profits, quantum of profit attained by the RRBs which are running on profits year on year, number of RRBs running on losses and the quantum of loss that they are incurring year on year basis. Net profit earned by those RRBs which are running on profits and the growth in the net profit earned by the RRBs which are running on profits in India over the ten year period from 2007-08 to 2016-17 is also shown. RRBs number in India for the study period from 2007-08 to 2016-17 decreased gradually from 91 in 2007-08 to 82 in 2009-10 and this number remained constant for another two years i e from 2010-11 to 2011-12. Further, this number went down to 64 in 2012-13 and decreased gradually to 56 in 2014-15 and remained constant for another two years i e from 2015-16 to 2016-17. The RRBs number which earns profits gradually decreased from 82 in 2007-08 to 49 in 2016-17 except in 2011-12 when the RRBs earning profit just increased by four. The quantum of profits increased continuously for a certain period of time i e from 2007-08 to 2009-10. Thereafter for another period of seven years the quantum of profit fluctuated. The loss making RRBs number gradually decreased from 2007-08 to 2012-13 and increased from 2014-15 to 2016-17 and no RRB has incurred loss in 2013-14. The amount of loss incurred by them is much decreased from 2007-08 to 2012-13 except in 2013-14.

From the foregoing analysis one can infer that the number of RRBs decreased gradually. Number of RRBs attaining profit also decreased. Profit



earned by these Banks substantially increased in most of the years of ten year study period. The same trend is observed even in the case of attaining the net profit. But the growth in attaining the net profit is not impressive.

Findings

- The progress in the number of bank branches of RRBs in absolute terms is much impressive. But the growth in the number of Bank branches of RRBs in percentage terms is not impressive. The spread of Bank branches in districts is also progressive for the study period from 2007-08 to 2016-17.
- The deposits of RRBs substantially increased from year to year for the entire study period of ten years from 2007-08 to 2016-17.
- The deposits per branch of RRBs also increased significantly over the ten year study period except in 2011-12. But the growth in the deposits of RRBs per branch is not impressive in the beginning of the first five years of the ten year study period. In the later period of four years the growth in the deposits of RRBs per branch is impressive.
- The loans and advances of all the branches of RRBs together and advances per branch of RRB for the study period from 2007-08 to 2016-17 in absolute terms increased continuously. But the growth in the loans and advances of all the branches together and the advances per branch is not continuous and steady.
- The investments of RRBs in absolute terms increased from 2007-08 to 2016-17 except in 2014-15 when the investments of RRBs decreased considerably. The increase in the investments of RRBs in the current year is much higher than the investment in its previous years except in 2014-15. But the growth in the investment of RRBs year on year from 2007-08 to 2016-17 is not impressive
- The number of RRBs decreased gradually. Number of RRBs attaining profit also decreased. Profit earned by these Banks substantially increased in most of the years of the ten year study period. The same trend is observed even in the case of attaining net profit. But the growth in net profit is not impressive.

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SENIOR CITIZEN 'PARENTS' OF 'MARRIED CHILDREN' OFTEN FEEL NEGLECTED IN CONTEMPORARY SOCIETY

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Abstract

Increased perception towards commercial expectations in life has forced human to neglect relationship in its depth. The efforts and sacrifices parents put in the upbringing of their children has forgotten thanklessly. It is alarming that the sentiments between the blood relatives has rotten due to commercial expectation and heightened lifestyle in metro cities.

Keywords: Craving, Unsolicited, dimensions, sentiments, sacrifices, upbringing.

Introduction:

India is growing young with old aged parents left neglected by many young Indians living for their spouse and comforts. Parents who sacrificed all their comforts for their children are left at old age homes due to shortage of time of their children as the best reasons known only to them. Traditional practices in Indian society is fading due to increased craving for increasing bank balance and city life style. One of the examples for the same is increasing admissions in old age homes in cities. Old Age has certainly not been a problem in our country where a value established, joint family system is prevailed. Indian culture is automatically respectful and supportive of elders. (1)Elder abuse, neglecting them has never been considered as a problem in India and has always been thought of as a western problem. But, the handling dimensions of the younger and grownup family members are now being dared and often there is unsolicited behavior by the younger family members, which is practiced as abnormal by the older family member but cannot however be labelled.

Methodology and Sample:

Group discussions were held in Bangalore city in 6 locations with diversified age groups, 2 groups were senior citizens, 2 groups were students and 2 groups were married and employed in private companies in Bangalore. Each group consist of equal number of male and female participants who deliberated their views on the



title ‘Senior citizen parents of married children often feel neglected in contemporary society’. Each group had 30 participants.

Abuse is reported more from the family members, with daughter in law and sonemerging as the major abusers. Half of the elderly from the lower socio economic strata reported facing abuse because of lack of emotional support. Last year among the elderly from higher socio economic strata, property issues emerged as the most common context for abuse. (3) Unwillingness to raise any voice against negligence stems from the perception among the elderly that - ‘it would lead to abuse’ and ‘sense of shame in the community’. Not getting engaged in to economic activity leads to negligence as the source of income and potential to earn is weak. So elderly parents if they are not earning then they are highly neglected. Many felt that self-dependence on economic needs and low dependency on monitory benefits from children / daughter in laws increases the dignity among their relatives.

In groups discussion of senior citizens they were at the opinion that,

For the question regarding “they were unanswered, neglected by their children or daughter in laws, more than four fifth of the elderly have experienced similar kind of humiliations. In the higher socio economic strata more than one third of the elderlyhad reported ever facing negligence. The proportion of elderly who reported to have faced abuse is highest among non-pensioners. Verbal abuse is the most commonly reported abuse faced by theelderly from lower socio economic strata while it was neglect reported by theelderly from higher socio economic strata.

In elderly citizens group 80% reported ever feeling neglected were further analyzed by their dependency on anyone to carry out daily routine activities further 67% of the elderly faced abuse from the daughter-in law and were also dependent on her for daily routine activities.

The problem stems from the fact that the elderly is dependent physically, emotionally, financially for their day to day activities which is frowned upon and seen as an inconvenience and burden by the children

Findings of the national survey conducted by helpage India in 2015 following findings are widely discussed and six groups have agreed the following remarks made in the survey report

Financial factor- Greed and desire to inherit property, Need to financially support the elders, Personal financial problems of the abusers.



Lifestyle factor of the abuser- Excessive stress that urban lifestyle bring, completely busy life of the abuser and the family members.

Health related factor of the elder- Poor mental health of the elders, Poor physical health of the elders.

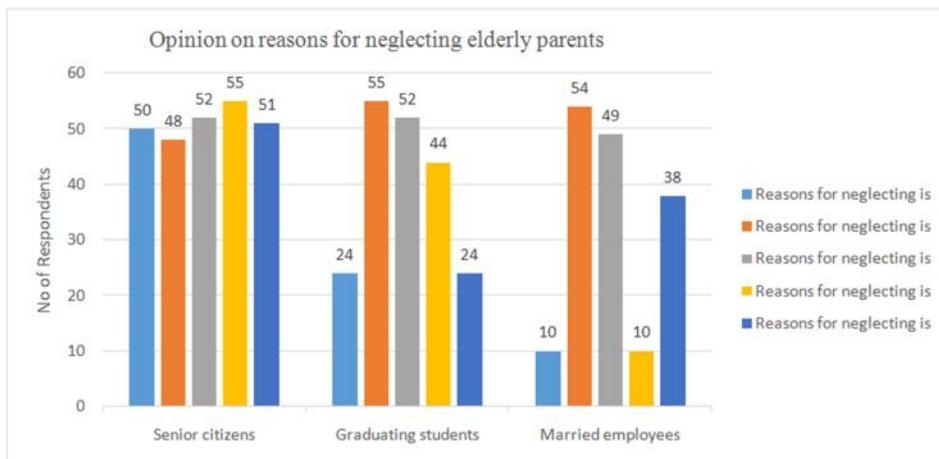
Self-factor of the elder- Lack of understanding of youth concerns by elders, Demanding attitude of the elders.

Generational factor- Lack of patience among the younger generation, changing value systems within the society. (2)

Findings:

Group discussions conducted at six different locations in Bangalore for three different age groups, interest groups following opinion was revealed.

Graph No. 1

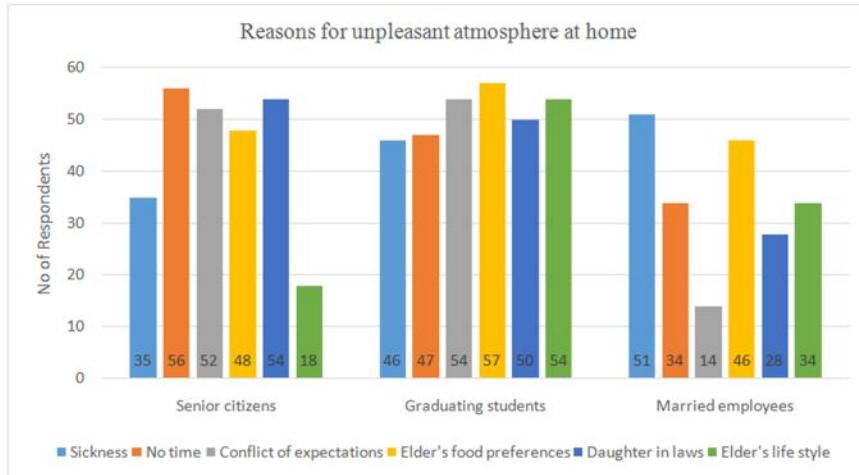


Among senior citizens, 50 are in the opinion that deteriorating health is the main reason for neglecting them by their daughter in law/son in laws or their children, but only 10 married employees who are in the age group of 40 to 55 years health is the main reason to neglect elderly parents in the society. Graduating students’ majority are in the opinion that health is not the reason for neglecting elders. Youngsters don’t agree that daughter in laws are the reasons for neglecting elders, but married employees and senior citizens say daughter in laws are the



reason for elders being neglected. But graduates agree that conflicting expectations, senior citizens not earning, not adjusting is the reason for elders neglecting by their family members.

Graph No. 2



Above data depicts as stated above reveals the perception and differences between senior citizens graduating students and married employees regarding the reasons for unpleasant atmosphere at home. Only 18 senior citizen respondents are in the opinion that their lifestyle creates unpleasant atmosphere at home. But 54 for postgraduate in student and 34 married employees are in the opinion that elderly parents lifestyle is one of the major reasons for spoiling happy atmosphere at home. 56 elderly citizens say their kids have no time for their parents and majority among graduating students and married employees agreed to this that due to lack of quality type given to the elderly parents might be the reason for not having jovial atmosphere at home. Among married working employees only 14 hour in the opinion that conflict of expectations exist between the elderly parents and their children but 52 elderly parents and 50 for graduate students are in the opinion that the conflict of expectations contribute a lot for unpleasant atmosphere at home. However majority agree in the three groups of respondents that the food preference conflict is one of the major reason for the unpleasant atmosphere. Similarly 54 senior citizens and 50 graduating students are at the opinion that daughter in law is one of the reasons for unpleasant atmosphere at home.

To conclude, generation gaps, perception differences, difference in expectations and lack of empathizing approach between family members have contributed a



lot towards the distance of relationship, emotional attachment and moral connectivity within the family. Change of lifestyle, change in personal priorities reduced prospect to elders and their care in Indian society, commercialized relationship has spoiled emotional connect, reciprocal commitment in the family. Self-centered view which has acquired due to the self-comfort level has reduced the space in the emotions of human being for the elders who have spent the largest span of life for the betterment of their children delivered old age home in our country. Our growing tender kids are perceiving negativity out of this where “aging have no place at home” and in future Indian society may not have space for relationship and respect to the parenthood.

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IMPLEMENTATION OF CONTINUOUS AND COMPREHENSIVE EVALUATION IN THE DISTRICT OF KARIMNAGAR AT ELEMENTARY LEVEL-A STUDY

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Introduction:

The Continuous and Comprehensive Evaluation (CCE) is an Evaluation system that aims to improve student's performance by identifying their learning difficulties at regular intervals. It helps in employing suitable remedial measures to enhance student's learning outcomes. Education is one key factor that helps students grow up becoming socially and professionally acceptable; Knowledge helps oneself to figure out various ways to tackle challenges of real life.

It's a system of doing school based Evaluation of students, covering every aspects of student's development. The assessment covers both scholastic subjects as well as co-scholastic areas such as performance in sports, arts, music, dance, drama and other cultural and social activities

Evaluation is a backbone of any education system and it needs to undergo substantial changes according to requirements in the society. The process of teaching –learning seems to be worthless and direction-less without a vibrant and effective system of evaluation. The two main purposes of evaluation in education system are to seek essential information for taking good decisions regarding educational priorities, deployment of available resources in the right direction.

Accordingly, National Curriculum Framework- 2005

To modernize the education system of the nation, the National Curriculum Framework-2005 is a tool.

Directives of NCF-2005

- Connecting knowledge to life outside the school.
- Ensuring that learning is shifted away from the methods.
- Enriching the curriculum to provide for overall development of students rather than remain textbook centric.
- Making examination more flexible and integrated into classroom life.
- Nurturing an over –riding identity informed by caring concerns within the democratic polity of the country.



Therefore, evaluation needs to be continuous and comprehensive covering various aspects of both the scholastic as well as the non-scholastic in relation to students' achievement.

School is an institution where talents are nurtured. Therefore it becomes very important to continuously revise and introduce such measures and schemes which will impact the mind. Character and physical ability of the learner. Indian education is moving from Summative to a Continuous Evaluation System.

In 2009, the Right to Education (RTE) Act had mandated continuous and comprehensive evaluation (CCE) of a child's understanding and ability to apply the same to complement policies such as no detention and age appropriate admission at the Elementary stage among its slew of reform measures having the potential to transform the institutional structure and climate of Elementary Education in India (Kumar, 2017).

Right to Education Act-2009- Evaluation

RTE has not only focused on the right to education but also on the quality of education too. The instructions to be followed to ensure quality in Elementary education are given in the 5th chapter of the act.

It indicated that while laying down the curriculum and the evaluation procedure, the following points should be taken into consideration.

- Conformity with the values enshrined in the constitution.
- All –round development of the students.
- Building up student's knowledge, potentiality and talent.
- Development of physical and mental abilities to the fullest extent.
- Learning through activities, discovery and exploration in a student friendly and students centered manner.
- Medium of instruction shall, as far as practicable, be in student's mother tongue.
- Making the students free of fear, trauma and anxiety and helping the students to express views freely.
- Continuous and Comprehensive Evaluation of students understanding and knowledge and his / her ability to apply the same.
- No students shall be required to pass any Board examination till completion of Elementary Education.
- Every students completing his elementary education shall be awarded a certificate, in such form and in such manner as may be prescribed.



The present paper is an attempt to inquire about the application of Continuous and Comprehensive Evaluation (CCE) in the district of Karimnagar at Elementary level.

Objectives of the Study

- ✓ To Know the Implementation of Infrastructural & Instructional Facilities in Elementary schools?
- ✓ To Know the Implementation of RTE Implementation & Training Facilities in Elementary schools?

Research Question

- How CCE implemented in Elementary level?

Sample and Sampling procedure:

The sample of the present study was comprised of 60 government schools located in Karimnagar. A sample of 60 Teachers teaching and served as Headmaster Eight Standard. Simple random sampling Technique was used for the selection of government schools.

Tools: The researcher could not find any appropriate standardized tool for the present study. Thus in the absence of the standardized tool the questionnaire used for the collecting of data was constructed by the researcher himself.

Methodology of the study:

Descriptive Survey method is employed to collect the data in this present study.

Statistical Analysis of the Data:

The total scores obtained by the Headmasters on all the indicators were computed. The data was carefully analyzed by employing the percentage to find out the responses of the Headmasters on the research indicators.

These 9 items are based on four dimensions. Infrastructural Facilities, Instructional Facilities and RTE implementation etc.

Table

S.L. No	Statements	Always	Sometimes	Never
1	The Classroom are organized by the ratio of students	95	2.5	2.5
2	Drinking water provided to the students in the schools	100	00	00
3	The playground is provided to play for the students	77.5	20	2.5
4	Teachers make use of ICT & TLM delivering their lessons.	97.5	2.5	00
5	Teachers make use of TLMs delivering their lessons.	56	35	9
6	Availability of their instructional materials	85	15	00
7	Students are considered to be Entitled to RTE	95	5.00	00
8	Students face difficulties for admission during the academic year	12.5	47.5	40
9	Eligibility exam taken before the admission	45	27.5	27.5



Interpretation:

The above table indicates four dimensions related to the infrastructural facilities, instructional facilities, and RTE Implementation and training facilities. Three questions were asked related to these four dimensions from the Headmaster. The first three statements were related to the infrastructure available in the school, like the classrooms are as the ratio of the students for this statements the percentage of Headmasters who responded that they always take care of student's classroom ratio whereas 2.5 responded they only do it. Sometimes and another 2.5 told they never follows any such rule. Another statements from the same category was about the availability of drinking water for the students and in response to this statement almost 100% Headmasters told that they have proper facilities available for drinking water in the school. Drinking water being the basic necessity as one can't survive without water and if the students is coming to school for six hours he must have this facility in order to survive. The last statements regarding the same dimension was the availability of a playground co-curricular activities and games are part and parcel of school curriculum, so for all round development of the students. There is a great need of play ground in a school. The responses informed that only 77.5% schools were having properly maintained playgrounds, while 20% headmasters told that they use open field's available outside schools as the playground and 2.5 % schools were found to have the students no such facility made availability to the students at their end. Thus it is very clear from the table that in some schools students get no chance for physical developments they lack the facility of playground.

Second dimension which dealt with the instructional facilities had three statements regarding teaching learning materials , use of ICT and other instructional materials here for the first statement 97.5% percent headmasters told that their teachers always make use of teaching learning materials like charts real models specimen , and posters as we all known teaching learning materials are for making the process of teaching interesting and motivating and it was found that almost all schools have the facility only 2.5% headmaster informed that their teachers sometimes uses teaching learning materials to make teaching easier . Another statements of the same dimension was regarding the use of ICT in classrooms for this only 56% headmasters told that their teachers always make use of ICT they use computers projectors personal laptops while delivering their lessons whereas in 35% schools there is no proper facility for using laptops or projectors but sometimes they make arrangements for such things 9% schools head masters informed that they never used anything based on ICT in their schools. Third statement was regarding availability of other instructional materials like blackboard white board, text books, worksheets, dictionaries etc. It was found from the results that in 85% schools the blackboard are available and



some of them have one white board for writing important notices or use it for their teaching purposes while 15% headmasters informed that they have black board but they are in a poor condition and need maintenance there was not a single school which was without a black board.

The third dimensions dealt with the students admission RTE, and the difficulties faced by the students for seeking admissions regarding the first statement 95% Headmasters always consider the students entitled for RTE and they give them enough awareness about their rights as a student's only 5% Headmasters denied that they don't have such facilities but sometimes students turn gap with such cases. Another statement was about the problems faced by the students for seeking admission for this only 12.5% headmasters informed that they face such problems each year as the students fails to produce proper documents at the time of admission, whereas in 47.5% such problems are faced only sometimes and in 40% no such problems are ever faced. Next statement of the same dimension dealt with the entrance test for admission here 45% schools were found to conduct certain eligibility test for admitting the students in higher classes, where as 27.5% conducts such tests only when they full the necessity whereas 27.5% schools never conducts tests for admission, they directly give admission on the basis of previous year marks memos.

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A STUDY ON FINANCIAL EFFICIENCY OF MILMA

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Abstract

Dairying has played a prominent role in strengthening India's rural economy. Milma, the brand name of Kerala Co-operative Milk Marketing Federation (KCMMF) is haulage out its operations in Kerala. KCMMF has three unions viz. Trivandrum Regional Co-operative Milk Producers Union (TRCMPU), Ernakulam Regional Co-operative Milk Producers Union (ERCMPU), Malabar Regional Co-operative Milk Producers Union (MRCMPU). This study makes an attempt to analyze the Union wise competitiveness of KCMMF Ltd (Milma).

Key words: KCMMF, Financial efficiency, Marketing, Ratio Analysis, MRCMPU, TRCMPU, ERCMPU

Introduction

The importance of dairying in a country like India hardly needs emphasizing. India has vast resources of livestock, which play an important role in the national economy. During the 1950s and 1960s, India was one of the largest importers of dairy products, importing over 40 percent of milk solids in the total throughput of the dairy industry. The commercial import of milk powder reached its peak at about 53 thousand tons in 1963-64 (Kanitkar, 1999). The Kerala Co-operative Milk Marketing Federation Ltd (KCMMF) is the apex body of the dairy co-operatives in Kerala. KCMMF (popularly referred to as Milma) procures milk from farmers and sells processed milk and milk products throughout Kerala. It is the duty of KCMMF to maintain stable price for milk and to ensure adequate supply of milk in the market of Kerala.

During the period 2014-15, KCMMF represents 3206 registered APCOS, of which 2859 functional APCOS comprising 7.33 lakh dairy farmer members. The three regional unions TRCMPU, ERCMPU, and MRCMPU procured an average quantity of 9.96 lakh litres of milk per day Average selling of milk per day by the three unions during the period 2014-15 was 12.29 lakh litres. Turnover of KCMMF during this period was Rs.336.52 crore and its profit after tax during this period was Rs. 0.8 crore.i One of the major inputs provided to the dairy farmer of the state by KCMMF is balanced cattle feed that has high level of



acceptability. KCMMF, operates two cattle feed plants-one at Pattanakkad with a capacity of 300 MT per day which produces mash feed and the other at Malampuzha with a capacity of 300 MT per day which produces cattle feed in mash form. Besides the supply of balanced cattle feed, the members of APCOS are provided with veterinary health cover.ii The Central Product Dairy (CPD) is managed directly by the KCMMF. At present, it has a milk processing plant, an aseptic packaging station and a milk powder plant

Review of Literature

Kale et al (2000) studied the financial position working and operational efficiency of 23 dairy cooperatives in Raigad district of Maharashtra. They studied the economic efficiency through income expenditure ratio, expenditure income ratio, rate of return on capital and rate of turnover. They concluded that (i) the societies had low owned capital and were dependent on borrowing from financial institutions (ii) even though the working capital of the dairy cooperatives was low, their turnover was high because dairy cooperative did not make payment to milk producers from their own funds. Therefore, dairy cooperatives were able to carry on business with limited capital and (iii) majority of the societies was trading profit.

P.D. Erasmus (2010) has identified that there is significant negative relationships between the firm's profitability with its net trade cycle (NTC), liquidity ratio and debt ratio. They also found that the liquidity ratios and debt ratios plays a more important role than net trade cycle.

B.S. YOGESHA AND B. MAHADEVAPPA (2011) have conducted study on Value Added Ratios of Indian Oil Corporation Ltd. They have calculated the Value added ratios by analyzing the value added statements. They suggested that to improve the current accounting practice, the profit and loss account is to be restarted with value added statements.

Pawan Kumar et al. (2013) identified that the financial performances are improved by minimizing the expenses and by concentrating on the current and quick ratios.

Objectives of the Study

1. The main objective of the study is to find out the financial performance of Milma Dairy
2. To determine the quantum and structure of the current Assets of KCMMF



Methodology

The study is an attempt to examine the financial efficiency of Kerala cooperative milk marketing federation limited. It is mainly based on secondary data. **The secondary sources** of data were collected from sources such as standard textbooks, conference materials, newspapers, journals, magazines, publications, reports, periodicals, articles, research papers, websites, company publications, manuals, booklets etc.

Research Results

Table 1

Turn Over of KCMMF Units

Year	CFP(P)	CFP(M)	CPD	Total	% of increase over the previous year
2016-2017	14631.24	13129.23	14781.10	42540.57	8.58
2017-2018	17274.54	13514.75	16306.44	47095.73	10.71

Source: Secondary Data

From the above table shows that the KCMMF Units turnover increased during the year 2017 – 2018 i.e., 10.71

Table 2

Paid up Share Capital of Kcmmf (2017-2018)

	Rs. in Lakhs
TRCMPU	238.77
ERCMPU	220.75
MRCMPU	292.41
TOTAL	751.93

Source: Secondary data

From the above table shows that the paid up share capital of KCMMF Rs. 751.93

Table 3

KCMMF Dairy (2017-2018)

	No. of Employees	No. of Societies pouring	No. of Agents	Average Procurement LPD	Average Milk Sale
Thiruvananthapuram	201	296	2003	131691	201641 LPD
Pathanamthitta	67	164	1001	43245	62421 LPD
Kollam	126	227	1684	92684	118738 LPD
Source: Secondary data					



Table 4
Current Ratio

Current ratio is the common ratio for measuring liquidity. It represents ratio of current assets and current liabilities. It is also called as working capital ratio. The current ratio measures its short term solvency.

Current Ratio = Current assets/ Current liabilities

Year	Current Assets (in lakhs)	Current liabilities (in lakhs)	Ratio
2013-2014	1300.55	2040.50	0.63
2014-2015	3169.48	2534.29	1.25
2015-2016	4633.80	2484.55	1.86
2016-2017	2116.66	2606.10	1.04
2017-2018	3564.66	3128.16	1.13

Source: Secondary data

From the above table reveals that the current ratio of KCMMF during 2013 -2014 to 2017 -2018. 2015 to 2016 current ratio 1.86. Therefore, the liquidity position of KCMMF satisfactory even though the ratio for the subsequent years is less than the conventional norm.

Table 5
Quick Ratio

It is the ratio of quick assets to current liability. It is determine by dividing quick assets by quick liability.

Quick ratio = Quick assets/ Current liability

Year	Quick Assets (in lakhs)	Current liabilities (in lakhs)	Ratio
2013-2014	478.94	2040.50	0.23
2014-2015	2554.31	2534.29	1.00
2015-2016	4044.96	2484.55	1.62
2016-2017	1520.68	2606.10	0.58
2017-2018	2099.99	3128.16	0.67

Source: Secondary data

The ratio is more than 1:1 then the financial position of the concern is sound and good. Liquid ratio is true test of business solvency. It shows that not good sound position of the firm quick assets to meet all its current liabilities.

Table 6
Absolute Liquid Ratio

It is the ratio of absolute liquid assets to current liabilities.

Absolute Liquid Ratio = Absolute Liquid assets/Current Liabilities



Year	Absolute Liquid assets (in lakhs)	Current liabilities (in lakhs)	Ratio
2013-2014	17.74	2040.50	0.008
2014-2015	394.33	2534.29	0.15
2015-2016	774.15	2484.55	0.31
2016-2017	698.32	2606.10	0.26
2017-2018	954.04	3128.16	0.30

Source: Secondary data

From the above table reveals that the Absolute Liquid Ratio is very low hence it indicates that the firms liquidity position is not good

Table 7

Fixed Asset Networth Ratio

The ratio shows that the relationship between fixed assets and shareholders funds. The purpose of this ratio is find out the percentage of fund invest in fixed asset

Fixed Asset Net worth Ratio = fixed asset / shareholders funds

Year	fixed asset in lakhs	Net worth in lakhs	Ratio
2013-2014	1805.25	1535.19	1.17
2014-2015	2023.57	1760.82	1.14
2015-2016	2113.50	2075.80	1.01
2016-2017	4266.28	2756.53	1.54
2017-2018	3923.94	2965.96	1.32

Source: Secondary data

Form the above table shows that the fixed asset net worth ratio of KCMMF. In the year 2016 to 2017 ratio is 1.54.

Conclusion

The study reveals that the financial efficiency of milma dairy. The research results indicate that the performance in terms of the firm can be further improved. As Milma is processing and selling milk and milk products in large scale, a small change in the procurement and selling price ultimately results high change in the earnings of Milma at the end.

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VALUE BASED EDUCATION: A CATALYST FOR HOLISTIC PERSONALITY DEVELOPMENT

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Abstract

Education is an agent of social change, as it necessarily reflects society's main ethos, aspirations and concerns. The future scenarios of the political, social, cultural and economic sectors will depend on the contributions of the students of our schools today. It is believed that life skills and value education taught in schools and colleges lay foundation of an individual to lead a value based life. Teachers perceive and believe that teachings of human values bring positive personality traits in students and thus value education may be made mandatory in formal and non-formal educational institutes. There has been growing concern over the erosion of values among youth and a need is felt for empowering them through education.

The central idea behind value education is to develop essential values among the students as it teaches to manage complexities that can be continued and further developed. Value education is a vital ingredient required to develop a strong moral basis to a student's life and to give them opportunity of doing well on the world. The school which gives education should also give equal importance to values, ethics and personality development as a means of preserving the standards of education. This paper emphasizes that value based education can act as a catalyst for holistic personality development of the students and enable them to lead happy and successful life.

Key Words: Value Education, Personality Development

Introduction

Education has long been recognized as a central element in development. It is necessarily a process of inculcating values to equip the learner to lead a life that is satisfying to the individual in accordance with the cherished values and ideals of the society. It promotes knowledge, skills, habits, values, or attitudes and understanding of the people in the country. The utmost gift that education gives is knowledge of set of values and genuine science. The values comprise the simple difference between wrong and right, the significance of self-respect and



hard work. Education based on values is development of an individual in three folds irrespective of their Gender And Age. It Endeavors In Developing Three Aspects Which Are Character, Physique And mentality as well. Even though mentality as well as physique is significant, yet becomes a threat without character. Learning is a creative way of inculcating emotional, psychological, moral, physical, aesthetic, intellectual and spiritual dimensions of the developing student.

Value Education

The term value education can be defined as a multifaceted process of socialization in schools, which transmits dominant social values in order to provide and legitimate the necessary link between the individual, the group and society. It is a planned educational programme aimed at the development of values in students, which also encompasses the transmitting of moral and ethical traits and standards. In the words of Gawande (2002), when human values are inculcated through curriculum to transcend to cognitive, affective and psychomotor level for conducive development of individual, society, national and international understanding, it is called value education.

Value orientation of education is an important means to achieve the re-orientation and re-energisation of education. This can help human beings to conduct themselves in the more desirable directions, and to shape their life patterns by strengthening their beliefs and by integrating facts, ideas, attitudes and actions. It can also help people to become a useful member of the society and develop an appreciation of their culture heritage and live more satisfying lives (Bequist, 1992; Bloom, et al., 1981).

The importance of developing values has long been embedded in the age old traditions of India's civilisation and cultural heritage which spanned over centuries. The concerns for value education are reflected in our key policy documents from time to time. After independence the National Commission of Secondary Education (1952-53) was a significant landmark in emphasising character building as the defining goal of education. The National Curriculum Framework for School Education (2000), constituted after the National Policy on Education (1986), lamented the "erosion of the essential social, moral and spiritual values and an increase in cynicism at all levels." This framework advanced a plea to integrate value education into the curriculum asserting that "Schools can and must strive to resolve and sustain the universal and eternal values oriented towards the unity and integration of the people enabling them to realize the treasure within." (p.8). It further stated that "the entire educational process has to be such that the boys and girls of this country are able to see good,



love good and do good, and grow into mutually tolerant citizens.” (p.36). The National Curriculum Framework NCF (2005) echoed the vision of education where values are inherent in every aspect of schooling.

What are Values?

Values regulate and guide human behaviour and action in everyday life. Values are formed on the basis of interests, choices, needs, desires and preferences. When preferences acquire certain definiteness, intensity and stability, these become the criteria for judgement, choices, action and grounds for decision-making in behaviour. Values thus are considered to be enduring beliefs upon which human beings act by preferences and are relatively resistant to change (Meglino & Ravlin, 1998; Ravlin & Meglino, 1987, 1989; Rokeach, 1973).

Categories of Values

Value may be classified as follows:

1. **Personal values:** Hygiene, personal cleanliness, dignity of labour, sincerity, health punctuality, regularity, self-worth, and cooperation, free from dogma and superstitious, open-mindedness, positive scientific attitude, search for perfection, self- respect and self- reliance.
2. **Intellectual values:** Freedom of thought, knowledge, mental evolution, convergent and divergent thinking, critical observation, inquiry and investigation, critical observation, imaginative and creative thinking and systematic reasoning
3. **Spiritual and environmental values:** Inclusiveness, pluralism, self-realization, conformity with natural law, and harmony with religious doctrines.
4. **Moral values:** Self-control, devotion to duty, patriotism, nation, love for family society, honesty and sincerity.
5. **Social values:** Respect for all religions, cooperation, tolerance, environmental protection and preservation, good manners and etiquettes, Art and Culture, social justice love for family

Need to Imbibe Values

In the present Indian scenario, due to manifold changes such as population explosion, advancement in science and technology, knowledge expansion, rapid industrialization, urbanization, mobilization, IT revolution, liberalization, privatization and globalization as well as the influence of western culture, present society has become highly dynamic. The degeneration in the present day life, the



demoralization of public and private life and the utter disregard for values, are all traceable to the fact that moral, religious and spiritual education has not been given due place in the educational system (Rena, 2006). Modernization process is accompanied with multi fold problems like anxieties and worries to human life. Growing poverty, pollution, hunger, disease, unemployment, unsociability, caste system, child labour, gender inequality, ill-treatment of women, violence, disability, exploitation of natural resources and many such evils have caused value- crisis that are adversely affecting the core human values such as honesty, sincerity, morality and humanity which resulted in a great transition in human society. To overcome such problems of the present era, inculcation of values among individuals and promotion of values in educational system, as well as society, is highly essential (Munir & Aftab, 2012).

How to Inculcate Values?

Values education is an essential part of school pedagogy, even though the nexus between values education and pedagogy is difficult (Zajda,2014). Educators are tasked with the job of helping children see that values are not only an important part of the educational process but also to their overall development as an individual. Various co-curricular and curricular activities are required to be given proper orientation, to be an instrument of inculcation of values. In fact, values should be woven in every activity of the school and also in every subject being taught. School environment and academic climate must be modified so that it provides rich experience to the students. The textbook material should be correlated with learning of values by identifying areas in which the desired values may be promoted.

By fostering an environment where core values are a focal point, it enables students to logically grapple with the moral life and encourages healthy brain development and growth. Value based education is an approach to teaching that works with values. It creates a strong learning environment that enhances academic achievement and develops students social and relationship skills that last throughout their lives.

Aims of Value Education

Value education aims to achieve two basic outcomes:

1. Helping students to better understand the values that guide their own daily lives and
2. Contribution to changes in values held collectively by communities and personally by individuals.

Value education is a process of teaching and learning about the ideals that a society deems important Tripathi & Tripathi, B.(2015). It may be seen on three



levels which interact with one another. They are Curriculum School and Community.

Students often see teachers as important role models on par with parents (Rose, 2005). In this light, the teacher is more of a guide and facilitator, and indeed, the true partner in learning (Erwin, 1991). A teacher can help the students in developing a new attitude, a positive approach towards their daily learning tasks and sports, wanting to do something good for oneself, family, friends, society, country and the globe. The approaches to value education in the classroom have the following among their specific goals:

- Helping students to appreciate one another's cultural differences.
- Helping students and teachers to identify cultural stereotypes as presented in the media, when teaching values of cultural diversity.
- Teaching students to avoid using language that is insensitive, offensive, embarrassing or damaging
- To help students adopt multiple perspectives, conceptualizations and behaviors,
- To help students to be respectful and tolerant of other students with different backgrounds and beliefs
- Helping students to understand that social responsibility extends beyond local and national boundaries.

Approaches for Incorporating Values in Educational Programmes

Broadly, there are three different approaches of incorporating the dimension of values in educational programmes. One approach is based on a construct of an "ideal" or "model" person exemplifying the desirable habits and attributes. The desirable traits are to be cultivated in the schools. This approach remained the hallmark of several education systems for a long time and gives a little sense of freedom in personal development. Another approach is based on the identification of values with the desirable abilities and skills which the instructional processes should aim to develop. Thus critical thinking, reasoning and problem solving abilities, learning to be enterprising, abilities to work cooperatively, and to work in an organization, initiative, etc. are abilities through which values are realised.

There is yet another approach, which is based on two basic premises. First, values are more than abilities and skills, as knowing what to do is different from know-how. Values call for a commitment of the whole personality and are therefore intrinsic to what we do and how we do it. In education, values are thus seen as a part of the processes of knowing and learning. Secondly, there are levels of significance in the realm of values, and these are reflected in the steps in



which the learners are exposed to them. In the light of this, one may think of values in terms of:

- (i) Personal context,
- (ii) Social context

Personal Context : It comprises of Integrity, caring and compassion, authenticity, sensitivity to human individuality and to life in all its forms, sensitivity to human rights, self-understanding, self-restraint etc.

Social Context : It comprises of Sense of responsibility, understanding and tolerance of difference and pluralism, co-operative, concern for public good, non-exploitive etc.

In addition, values must ultimately rise to a moral vision which would enfold knowledge, beauty, truth, virtue, harmony, love, justice, freedom terms of the levels of significance etc.

Value Education and Personality Development

Personality is the aggregate of ways in which an individual interacts and reacts with others. Personality generally refers to all what is unique about a person, the characteristic that makes him/her stand out in a crowd. For holistic development of students, there is a need of moral, ethical physical, spiritual and emotional development. Teaching moral values will help to have enriched and refine personality by the development of moral, aesthetic and spiritual aspect of one's personality. Democratic qualities like social justice, dignity, equality, fraternity liberty etc. are also needed in grooming personality. Corporate and higher education institutions of India have defined personality development by the way of improving communication skills and interpersonal skills which may include time and stress management, leadership, group dynamics, motivation, performance appraisal, negotiation, conflict resolution, team building etc. A moral value gives feeling of cooperation and fellow with people. It could strengthen youngster's commitment towards their personal values like care, compassion and self-esteem. It would assist individual to resolve some value conflicts and fixing standard of their behavior. Moral values are required for inculcating some qualities like honesty, courtesy, sacrifice, tolerance, humility, truthfulness etc. among the youth which help to develop positive attitudes for society and make them raising their voice for injustice. It helps to improve Personality development of students in lines of Leadership quality, communication skill, improvement in skill and attitude, team spirit etc.



Conclusions

The adolescent years are crucial in forming in the young minds the impressions and images of values, positively or negatively. A high proportion of these young years are spent in school, and clearly the schools have a responsibility and should have a commitment. Education in values begins at home and is shaped

by the parental values. The school's responsibility is a partnership with the home but progressively in line with the development of the child, the school's participation takes on a more divergent form. In the early years, the "values" are centred on formation of habits and manners and the basics, as it were, of co-operation, self-restraint, consideration of others, etc. With the growing self-awareness of the child, the "basic code" begins to undergo a process of internalizing. In the next phase of development, the notions of "right" and "wrong" with reference to one's own actions or other people's actions begin to emerge. Correspondingly, the reasons and explanations of the basic code are sought more consciously. These two phases complete an important cycle in the values education in terms of the socially and culturally-directed norms of personal behaviour.

The next stage, is marked by a high degree of awareness in the young person and of doubts, and questionings, of a search, possibly unaware of itself, of meaning and purpose. It is the stage of a growing sense of personal autonomy. This is the stage at which education with a commitment to values has to participate in the personality development in the young persons, directing the questionings to the personal relations and motives and to social responsibilities.

The young people should be exposed to the great ideas and great expression of values which have lifted humanity to the high ranges of the spirit and ideas of human dignity and freedom of individuality and social responsibility, of kindness and compassion.

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BUDDHIST SITE “JAGGAYYAPETA IN KRISHNA DISTRICT (AP)” : A CULTURAL STUDY

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Abstract

In the present article an attempt is made to understand the culture of Jaggayyapeta during the Buddhist period. This study is based on archaeological remains, including inscriptions that are found in this place. Jaggayyapeta played an important role as a Buddhist centre during the Satavahana and Ikshvaku periods.

Key Words: Buddhism, Mahachaitya, Sculptures, Stupas, Inscriptions, Viharas.

Betavolu was a flourishing town situated at a distance of four miles north of the junction of Krishna river and its tributary Palar. This is about thirty miles North West from Amaravati. When this location is carefully considered it strikes that Betavolu is situated on the northern bank of the river Krishna almost opposite to Amaravati. Betavolu was included in the Zamindari of Raja Vasireddy Venkatadri Nayudu, the Zamindar of Chintapalli in the 18th-19th Century (AD 1761 – AD 1816). It seems he constructed the town Amaravati and made it his capital. Betavolu also was rebuilt by him during the same period and was named Jaggayyapeta by him. This shows that the name Jaggayyapeta is a later one and its original name was Betavolu¹.

This place also became an important Buddhist centre and played an important role in the history of Buddhism during Satavahana and Ikshvaku periods. A large Stupa seemed to have existed here. As very few fragments of this Stupa are available it is not possible to do full justice in reconstructing the history of this Stupa. The sculptures found here are akin to those of the first phase of Amaravati excepting one. As such, historians conclude that this Stupa belongs to 200 B.C.².

It is well known that Dharanikota, a capital of the Satavahanas was a busy prosperous town with its mercantile activities of both inland and overseas. Amaravati which was in the vicinity of this capital had all the advantages of Dharanikota. In addition, it also enjoyed a peaceful atmosphere conducive to the religious activities. As such, Buddhists seemed to have chosen



that place for their activities. Similar is the case with Jaggayyapeta³ which is situated on the opposite bank of the river Krishna. The Purvasaila school of Buddhism which penetrated into this region finding both these places fit for its activities, must have occupied both the places and instead of bridging the river must have built two Mahacaityas to serve the people of both the directions. So most of the sculptures of Jaggayyapeta found are similar to the sculptures of the first phase of the Amaravati Stupa.

To the east of this town, in about a distance of a mile there is a hill of no great height. This is known as Dhana Bodu or Hill of wealth. There are a group of Stupas on the hill. Unfortunately, this mound was dug on the instructions of Vasireddy Venkatadrinayudu, the Zamindar of Chintapalli for the sake of the bricks and other marble material to be used for the temple construction and other buildings in this new capital at Amaravati. The farmers in the town made use of the mud in their agricultural fields. By the time Burgess visited this place in 1882 on a receipt of information, most of the material dug from the mound was utilized. The temple constructed at the foot of the hill a century ago also had the slabs similar to those of the mound He also noticed a portion of one of the five tall pillars which had adorned the east face of the Stupa. It bore the same inscription which is found on other two of them.

The following are the remains that are found at Jaggayyapeta:

- 1) The drum of the main Stupa i.e., the Mahacaitya.
- 2) A pillard mandapa
- 3) Ayaka projections in four cardinal points with Ayaka pillars.
- 4) Remains of a few sculptured slabs on the facing of the Ayaka and around the base.
- 5) Fragments of a Buddha image and a votive Stupa; and
- 6) A number of relief slabs that encase the drum base.

From the excavation it is found that the Stupa had a diameter of 31 ½ ft. It was also decorated with the same type of slabs that were found at Amaravati. From this the logical conclusion is that this marble must have been obtained from the same quarry.

The slabs surrounding the base of the Stupa which are in situ, are 3'9" above the level of a procession path of 10 ½ ft. wide. The rail is entirely lost. Portion of brick and lime base which supported the pillars of the outer wall are noticed.

The lower portions of pillars are found in the south-east of the Stupa. As the area and the line of the pillars do not face the Stupa it is conjectured that



there was a large hall, the roof of which was supported by these pillars. This must have been a mandapa which affords shelter to the visitors. The relics must have been deposited in a stone casket found there.

Very few slabs that surrounded the base had the carvings of small pilaster up the edge. Some of the carvings present a Makara, sea-horse, or other monster on which a male or a female figure stands. They may be probably Yaksas. On the capital there are two winged animals in sitting posture. This is similar to that of the Amaravati architecture. On some of the slabs a few letters of inscriptions which yielded no senses have been noticed. As these characters are of the Mauryan type it is surmised that the Stupa belongs to the second century B.C.

The carvings on the slabs of the basement are in very low relief and of archaic type. There is the drawing of a Punyasala, Sripada with four supporting pillars, inside and over this a chatra with the hanging garlands. Female figures and male figures also are noticed in poor proportions in each side division. The head dress of a female figure is an exact copy of some of these in Cave X at Ajanta⁴.

The most interesting figure we notice here is a tall male figure. This stands on a cushion with a high turban, heavy kundalas broad necklace, armlets an bracelets and the dhoti round his waist with folds hanging. Over his head there is an umbrella, cakra in front, an object like a drum behind his head. Above are clusters of objects and from five different points square objects stream down. A woman also stands on a cushion. She also has a peculiar head-dress and very heavy ear-rings with bulls, and anklets. She is below proportion. Behind, two youngmen were represented as paying reverence to him. They wore turbans and earrings. All figures stand on cushion. There is an elephant below, saddled and with its trunk raised towards the tall man. Though we cannot definitely guess who this person is, we can at least say that this represents a person in authority. The artist must have given expression to his imagination of a Cakravartin or an emperor.

The inscription⁵ found on the octagonal shaft is presumed to belong to 3rd or 4th century of earlier on the strength of the characters. This refers to a gift of the Ayaka pillars by an artisan in the period of the king Purusadatta of the Iksvaku family, who is not identified so far.



A standing figure of Buddha which is a later sculpture also is noticed. The inscription underneath this image seems to belong to A.D. 600 on the palaeographical grounds.

Thus the remains of Jaggayyapeta⁶ which are closely allied to the oldest of these at Amaravati which was in its height of glory by about 200 B.C. also point out to the same period. The figures at Jaggayyapeta lack the style and rapid movement of the later Amaravati and Nagarjuna Konda sculptures. Again, the proportion of figures is not seen at Jaggayyapeta.

According to Amita Ray⁷, 'the common denominator of tall, slim and elongated physiognomical form of mature Amaravati reliefs meets our eyes in Jaggayyapeta as well, rather in an accentuated form; but compositionally the style is altogether different. The figures clearly and precisely outlined at Jaggayyapeta are conceived and worked out in the second dimension as if it were, that is, they are not given a rounded form. Besides, each single figure introduces itself more or less independently without any compositional relationship among one another. There can be no doubt that aesthetically, that is formally speaking, the Jaggayyapeta reliefs are on a lower level of achievement. One may also note in this connection that these reliefs do not belong to the genera of Buddhist narrative reliefs!

Conclusions:

Jaggayyapeta became an important Buddhist centre as exemplified by the Buddhist remains such as the Mahacaitya, pillared mandapa, Buddhist image, votive stupa, relief slabs as well as the inscription found on the shaft. The sculptures bear similarity with the first phase of Amaravati which is also attested by the same type of slabs which were used to decorate the stupa at Jaggayyapeta. Since the characters of the inscription resemble Mauryan type it is likely that the stupa belonged to the second century B.C. Jaggayyapeta seems to have played a significant part as a Buddhist centre owing to its strategic location in the vicinity of Dharanikota and Amaravati.

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CRITICAL STUDY OF MINING WATER IN CHANDRAPUR, MAHARASHTRA

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Abstract

As per the data collected from GSDA the surface water storage is on extinct in Chandrapur district as most of the reservoirs are drying out due to inadequate rainfall in the district. Hence there is an urgent need of an alternative to the groundwater and surface water resources for which mined out water from coalmines could be an alternative. With this aim a systematic study was undertaken to analyze and assess the water quality of various coalmine sites and different places in and around Chandrapur city during 2010-2013 in my research work. Present paper investigates the quality of samples from discharged water from four mining areas in and around Chandrapur in the year 2010-12.

Keywords-GSDA, Reservoirs, Discharged Water, Mining Areas.

I. Introduction

Water is one of the abundantly available substances in nature. It is essential constituent of all animals and vegetable matter and forms about 75% of the earth's crust. It is also an essential ingredient of animal and plant life. Water is distributed in nature in different forms, such as rain water, river water, spring water, and mineral water. About 90 % of rural population of India is dependent on ground water for domestic as well as other purposes. The groundwater water sources used by people for drinking and domestic purposes could become worse and unsuitable for any purpose if rate of contamination and negligence remain the same in coming years. The demand for water for various uses is increasing day by day while the availability of useful water is practically remaining constant.

Water is an increasingly scarce and valued resource across the globe. Governments, communities and industries are experiencing unprecedented concern as a result of increasing demand from fast growing populations, unsustainable water practices and persistent droughts. We require water for all domestic needs ranging from cooking, cleaning, bathing drinking to gardening. Depleting water level in natural aquifer and pollution of underground and surface water is a serious problem that we are facing. Concerns of the community need to be taken into account for water resources development and management. There is an urgent need of assessment in this field as gallons of water from mine remain unutilized which could be used for different purposes in the region to overcome water scarcity.

Mining and associated Industrial activities in and around the mining areas lead to acute shortage of potable water. There has been a growing awareness in the country about the environmental hazards due to mining. Stopping mining of necessary natural resources, however, is not a solution to this problem. During Underground mining lots of water which is presently inside the earth's crust is released by mining and forms mine water,



which when pumped out becomes contaminated with different industrial effluents and loses its acceptable value. Water that is used in coal washing and separating processes is cycled through sedimentation ponds.

Study Area :Chandrapur

There are around 30 locations where coal reserves have been reported out of which 26 coal mine sites are in working position. The mining of coal is done through Open cast (16) ,Underground (08) and Incline (02) method of mining in the region The coal occurrence of the area is restricted in the rocks belonging to lower Gondwana Supergroup.

Coalmines under study-

1. Durgapur opencast coalmines(CM1)

It is located on latitude $19^{\circ}59'$ N to $20^{\circ}01'$ N and $79^{\circ}18'$ to $79^{\circ}19'$.It was started in 1980 and the coal production started in 1982.

2. Padmapur opencast coalmines(CM2)

It is located on latitude $20^{\circ}01'$ N to $20^{\circ}03'$ N and longitude $79^{\circ}17'E$ to $79^{\circ}19'$ E .It is 8 km from northern side of Chandrapur city and connected to Nagpur road. It was started in 1985.

3. Mahakali Underground coalmines (CM3)

It is located on latitude $19^{\circ}54'$ to $19^{\circ}58'$ N and longitude $79^{\circ}18'$ to $79^{\circ}30'$ E.It was started in 1922 and one of the oldest coalmines along all coalmines in the region.It is 2.5 Km from Chandrapur railway station and 1 Km from Chandafort railway station and connected to state highway No.19.

4. Hindustan Lalpeth opencast coalmines (CM4)

It is located on latitude $19^{\circ}53'$ to $19^{\circ}54'$ N and longitude $79^{\circ}18'$ to $79^{\circ}19'$.The Chandrapur city is 3Km away from the mine site and state highway is around 0.5 Km from the mine. This mine was started in 1985.It is located in the vicinity of Mana coalmines.

As per the data collected from GSDA the surface water storage is on extinct in Chandrapur district as most of the reservoirs are drying out due to inadequate rainfall in the district. Hence there is an urgent need of an alternative to the groundwater and surface water resources for which mined out water from coalmines could be an alternative.

In Present paper The seasonal variation from year 2010-2012 for water quality assessment of four out of twelve coal mines from discharge points (under study)are accounted for evaluation of pH, Temperature, Alkalinity, Total dissolved solids (TDS), Hardness, Calcium, Magnesium, Electrical Conductivity, Chemical oxygen demand (COD), Biological oxygen demand (BOD), Sulphate, Phosphate, Nitrate, Iron, Chloride, Fluoride, Sodium, Potassium, Dissolved oxygen (DO), Suspended solids and Turbidity.

II Methodology

For qualitative assessment water samples were collected in precleaned polypropylene bottles with necessary precautions [1-4]. Glassware used in the study were



of high quality borosilicate brand. Chemicals used were of AR/GR grade and obtained from Qualigen/ E-Merck/Hi-media.

All the sample bottles(2L)were labeled properly to indicate relevant information [2-5].Samples were collected from the sites in between 11:00 a.m. to 12:30 p.m.[6,7]and analyzed as per prescribed methods[4].

Water samples from 4 coalmines were analyzed during Pre-monsoon, Monsoon and Post-monsoon during 2010- 2012 and a total of 36 water samples were collected and investigated as per prescribed methods[4].

III. Observation Tables

Table 1: Analysis of water sample in 4 coal mines. Period of sample collection: Pre-monsoon 2010.

Parameter/Mines	CM1	CM2	CM3	CM4	Std. Value
pH	8.06	8.05	5.6	8.5	6.5-8.5
Temp	31	30.2	30	32	
Alkalinity	160	164	186	169	200-600
TDS	1113	1087	1312	1128	500-2000
Turbidity	8.0	7.6	6.0	12	10
Hardness	200	156	577.3	189	300-600
Calcium	160	50	92	64	75-200
Magnesium	36	22	32	21	30-100
Sodium	182	180	144	300	
Potassium	6.2	2.6	4.2	10.6	
Conductivity	30	32	40	36	5-50
COD	40	38	35	33	10
BOD	6	10	9	15	6
Sulphate	116	134	100	237	200-400
Phosphate	0.059	0.068	0.06	BDL	
Nitrate	2.63	2.65	1.6	1.798	50
Iron	0.202	--	1.7	0.13	0.3-1
Chloride	113	120	25	272	250-1000
Fluoride	--	0.81	0.2	0.62	0.6-1.2
S.S.	30	36	32	22	100
D.O.	5.5	5.4	3.0	5.7	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)

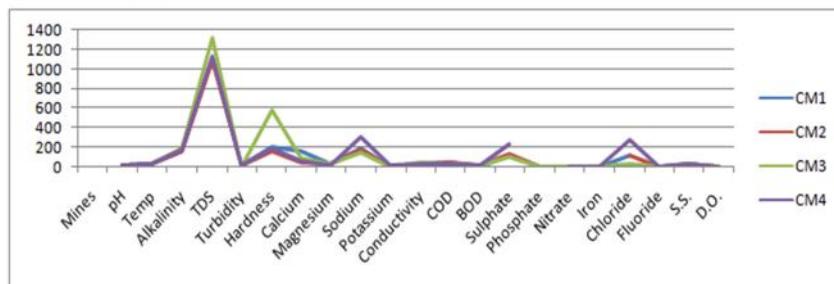


Figure1. Variation of various parameters of 4 coalmines: Pre-monsoon 2010

Table 2: Analysis of water sample in 4 coal mines Period of sample collection : Monsoon 2010

Parameters/Mines	CM1	CM2	CM3	CM4	Std. Value
pH	7.14	7.21	8.1	4.6	6.5-8.5
Temp	24	24	24.2	25	
Alkalinity	158	149	208	176	200-600
TDS	609	1189	1208	1680	500-2000
Turbidity	4.6	11	7.8	9.6	10
Hardness	200	176	516	182	300-600
Calcium	100	60	94	62	75-200
Magnesium	23	28	24	31.1	30-100
Sodium	58	110	116	98	
Potassium	3.0	4.0	3.0	2.0	
Conductivity	26	34	46	30	5-50
COD	39	38	39	40	10
BOD	14	12	10	16	6
Sulphate	90	184	102	120	200-400
Phosphate	0.02	0.09	0.03	--	
Nitrate	---	---	2.0	1.43	50
Iron	0.41	0.9	0.12	---	0.3-1
Chloride	255	190	218	300	250-1000
Fluoride	0.4	--	1.6	0.36	0.6-1.2

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)

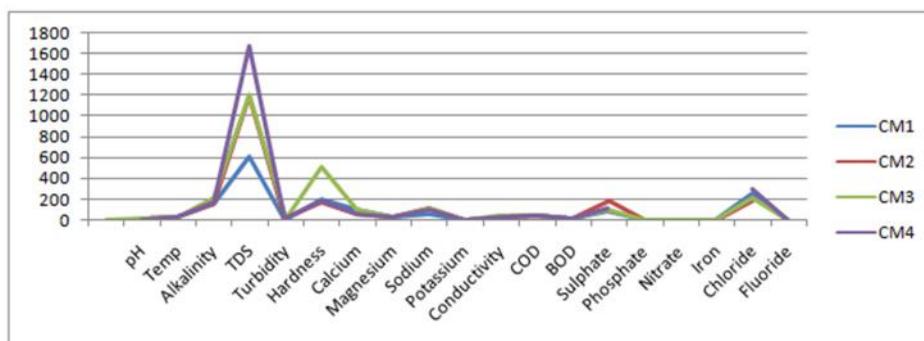


Figure2 :Variation of various parameters of 4 coalmines: Monsoon 2010



Table 3: Analysis of water sample in 4 coal mines Period of sample collection : Post-Monsoon 2010

Parameter/Mines	CM1	CM2	CM3	CM4	Std Value
pH	5.5	7.0	7.5	4.0	6.5-8.5
Temp	24.6	23	22	24	
Alkalinity	200	380	419	300	200-600
TDS	923	385	562	1240	500-2000
Turbidity	12	36	4.6	35	10
Hardness	800	240	364	280	300-600
Calcium	60	80	72	70	75-200
Magnesium	22	30	28	25	30-100
Sodium	68	192	88	109	
Potassium	4.2	16	3.0	12.6	
Conductivity	50	31	30	25	5-50
COD	40	14	40	140	10
BOD	20	4	31	60	6
Sulphate	198	188	96	410	200-400
Phosphate	--	0.02	0.04	1.2	
Nitrate	35.44	26.58	22.15	48	50
Iron	0.27	0.12	0.18	1.0	0.3-1
Chloride	88	88	156	100	250-1000
Fluoride	0.20	0.25	0.15	0.6	0.6-1.2
S.S.	22	22	36	120	100
D.O.	6.5	5.6	6.0	--	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)

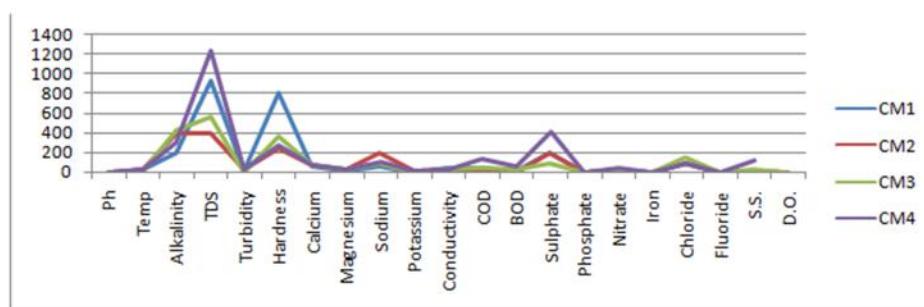


Figure3.Variation of various parameters of coalmines:Postmonsoon 2010



Table 4: Analysis of water sample in 4 coal mines Period of sample collection : Pre-Monsoon 2011

Parameter/ Mines	CM1	CM2	CM3	CM4	Std Value
pH	8.06	8.05	5.4	8.5	6.5-8.5
Temp	29.9	30.	29.7	29	
Alkalinity	137.8	140.8	167	152.91	200-600
TDS	1113	1087	803	1128	500-2000
Turbidity	2.5	10.8	6.23	8.98	10
Hardness	489.2	519.63	200.8	355.16	300-600
Calcium	58.26	61.9	52.8	69.63	75-200
Magnesium	20.29	33.01	21.71	23.2	30-100
Sodium	100	119	100.2	106.5	
Potassium	6.0	8.9	2.5	3.2	
Conductivity	30.43	26.83	32.53	31.66	5-50
COD	40	38	39.2	33	10
BOD	6	10	25.6	15	6
Sulphate	84	310	93	110	200-400
Phosphate	0.049	0.09	0.07	0.01	
Nitrate	2.6	2.36	2.02	2.1	50
Iron	0.4	0.002	0.12	0.15	0.3-1
Chloride	55	140	221	145	250-1000
Fluoride	0.97	1.5	0.9	0.9	0.6-1.2
S.S.	26	130	34	26	100
D.O.	6.8	6.9	5.3	6.7	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature ($^{\circ}$ C)

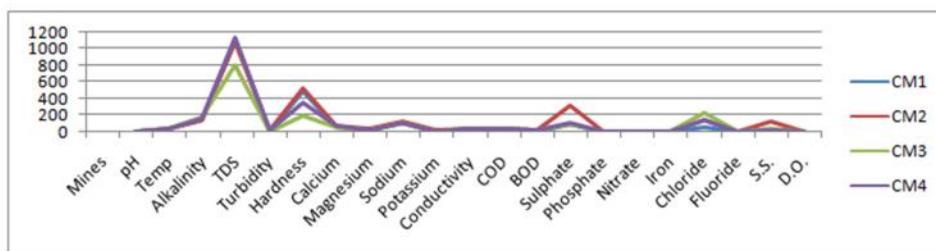


Figure4.Variation of various parameters of 4 coalmines: Pre-monsoon 2011



Table 5: Analysis of water sample in 4 coal mines. Period of sample collection: Monsoon 2011

Parameter/Mines	CM1	CM2	CM3	CM4	Std Value
pH	7.15	7.19	8.53	8.46	6.5-8.5
Temp	23.5	23.8	25	24	
Alkalinity	142	156.9	190.3	168.3	200-600
TDS	609	1189	1321	1086	500-2000
Turbidity	3.8	10.8	6.7	8.90	10
Hardness	210	158	580	194.2	300-600
Calcium	46.4	56.9	49.8	75.3	75-200
Magnesium	25.3	23	20.8	32.91	30-100
Sodium	70.8	102.2	106	110.3	
Potassium	3.2	3.4	2.5	2.8	
Conductivity	26.23	30.01	38.7	24	5-50
COD	39	38	38	39	10
BOD	14	12	9	13	6
Sulphate	36	422	130	540	200-400
Phosphate	...	....	....	....
Nitrate	2.4	1.82	0.86	1.23	50
Iron	0.42	...	0.1	0.2	0.3-1
Chloride	44	100	340	80	250-1000
Fluoride	0.9	0.52	2.0	0.92	0.6-1.2
S.S.	4.66	4.04	5.74	5.49	100
D.O.	96	32	20	42	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (⁰C)

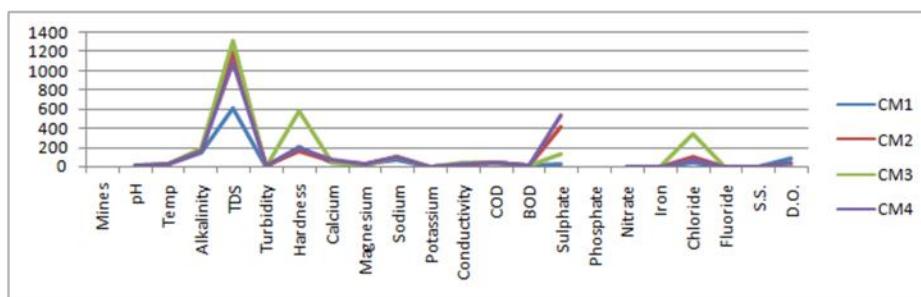


Figure5. Variation of various parameters of 4 coalmines: Monsoon 2011



Table 6: Analysis of water sample in 4 coal mines. Period of sample collection: Post-Monsoon 2011

Parameter/ Mines	CM1	CM2	CM3	CM4	Std Value
pH	5.5	7.0	8.5	7.8	6.5-8.5
Temp	24	22.3	20	21.9	
Alkalinity	198	365.2	500.3	289.3	200-600
TDS	1683	1033	968	1213	500-2000
Turbidity	10.8	6.5	2.6	39	10
Hardness	800	240	309.3	286	300-600
Calcium	56.2	67.9	58.8	68.78	75-200
Magnesium	23.8	31.24	24.6	20.6	30-100
Sodium	96	100	280	196	
Potassium	3.4	2.4	16.4	10.4	
Conductivity	49.6	30.7	28.3	21.42	5-50
COD	43	38	46	39	10
BOD	18.8	13.2	29.5	12.4	6
Sulphate	550	390	96	148	200-400
Phosphate	...	0.03	....	....
Nitrate	....	...	2.4	1.9	50
Iron	...	....	0.2	0.32	0.3-1
Chloride	42	60	190	1450	250-1000
Fluoride	0.32	0.6	2.4	0.92	0.6-1.2
S.S.	24	22	30	38	100
D.O.	5.4	5.12	6.4	5.34	4-6

***All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)**

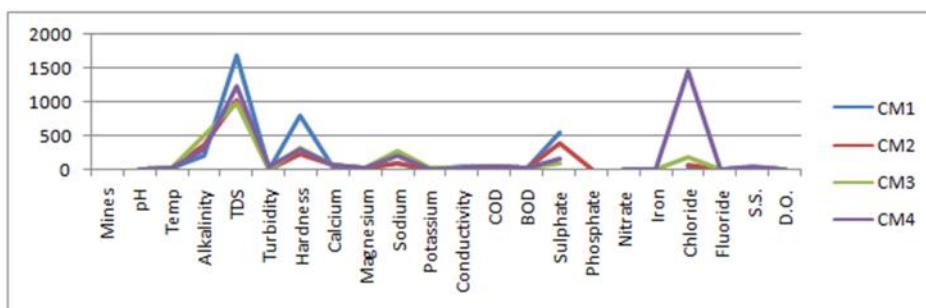


Figure6. Variation of various parameters of 4 coalmines: Post-monsoon 2011



Table 7: Analysis of water sample in 4 coal mines. Period of sample collection: Pre-monsoon 2012

Parameter/Mines	CM1	CM2	CM3	CM4	Std Value
pH	8.33	8.01	6.4	7.9	6.5-8.5
Temp	30.4	29.8	30	30.6	
Alkalinity	140	156	180	184	200-600
TDS	374	550	1306	1000	500-2000
Turbidity	0.8	6.0	6.0	10.6	10
Hardness	164	161	560	182	300-600
Calcium	98	56	96	76	75-200
Magnesium	36	20	40	29	30-100
Sodium	200	80	100	100.2	
Potassium	16.4	2.0	2.4	3.2	
Conductivity	28	30	36	32	5-50
COD	28	156	30	36	10
BOD	11	10	9	18	6
Sulphate	86	380	90	260	200-400
Phosphate	--	0.96	--	--	
Nitrate	---	1.46	2.0	1.8	50
Iron	--	0.96	0.4	0.2	0.3-1
Chloride	37	118	118	260	250-1000
Fluoride	0.96	0.4	0.96	0.63	0.6-1.2
D. O.	5.7	6.1	6.4	6.8	100
S. S.	22	126	28	26	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature ($^{\circ}$ C)

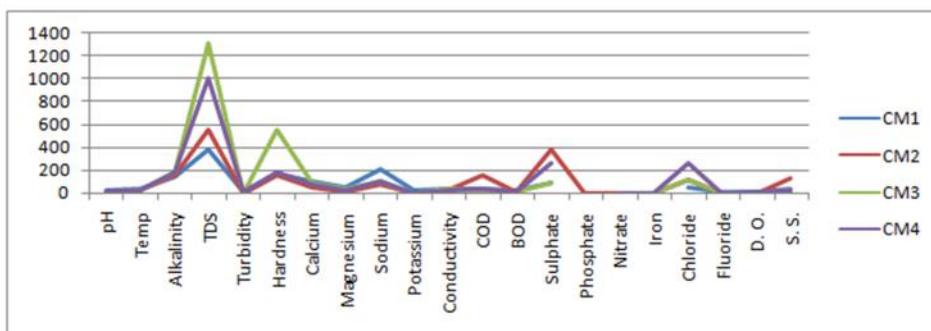


Figure7. Variation of various parameters of 4 coalmines: Pre-monsoon 2012



Table8: Analysis of Water samples in 4 coalmines.Period of sample collection : Monsoon2012

Parameter/mines	CM1	CM2	CM3	CM4	Std Value
pH	8.90	8.47	8.27	8.27	6.5-8.5
Temp	24	23	24	24	
Alkalinity	190	360	4392	300	200-600
TDS	139	744	840	628	500-2000
Turbidity	12.3	64	3.6	40	10
Hardness	752	203	300	286	300-600
Calcium	580	66	60	70	75-200
Magnesium	23	30.2	24	20.2	30-100
Sodium	102	78.4	80.4	72.4	
Potassium	4.4	1.8	4.0	3.2	
Conductivity	48	30.8	28.6	20.4	
COD	40	44	48	106	10
BOD	12	12	22	9.4	6
Sulphate	94	247	448	541	200-400
Phosphate	--	0.2	--	--	
Nitrate	0.752	3.02	2.8	2.3	50
Iron	--	--	0.2	0.4	0.3-1
Chloride	16	81	71	59	250-1000
Fluoride	0.92	0.68	2.86	0.86	0.6-1.2
DO	4.80	6.00	4.92	6	100
S.S.	24	40	32	24	4-6

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)

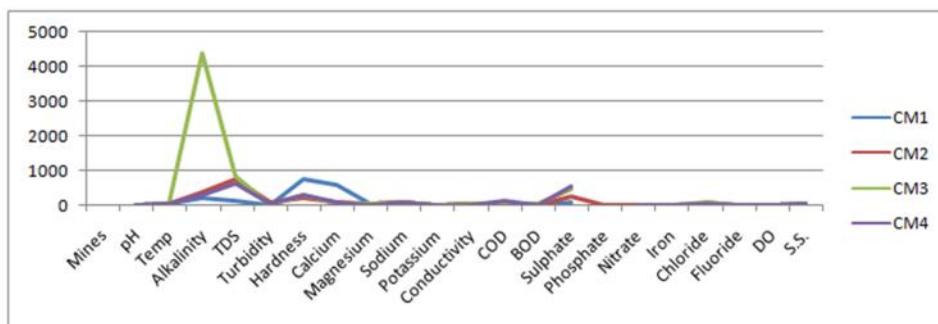


Figure8.Variation of various parameters of 4 coalmines: Monsoon 2012



Table9: Analysis of Water samples in 4 coalmines. Period of sample collection :PostMonsoon2012

Parameter/ Mines	CM1	CM2	CM3	CM4	Std Value
pH	5.7	5.0	6.3	7.9	6.5-8.5
Temp	24.3	25	29	30	
Alkalinity	185	189	140	138	200-600
TDS	1502	1498	1286	1110	500-2000
Turbidity	0.95	0.89	0.83	2.0	10
Hardness	488.7	486	306	480.9	300-600
Calcium	99.8	80.6	96.1	86.8	75-200
Magnesium	20.2	21.3	28	20.8	30-100
Sodium	70.8	76.8	95	68	
Potassium	2.8	2.93	2.4	2.4	
Conductivity	35.99	40	26.3	30.8	5-50
COD	35	36	42.2	39	10
BOD	15	15	8	5.9	6
Sulphate	243	243	106	242.3	200-400
Phosphate	0.039	0.040	0.036	0.05	
Nitrate	2.65	2.73	2.8	2.7	50
Iron	0.32	0.33	0.36	0.38	0.3-1
Chloride	111	109	110	112	250-1000
Fluoride	0.96	0.98	0.89	0.88	0.6-1.2

*All parameters in mg/l except pH, Turbidity (NTU), Conductivity (mS/m), Temperature (°C)

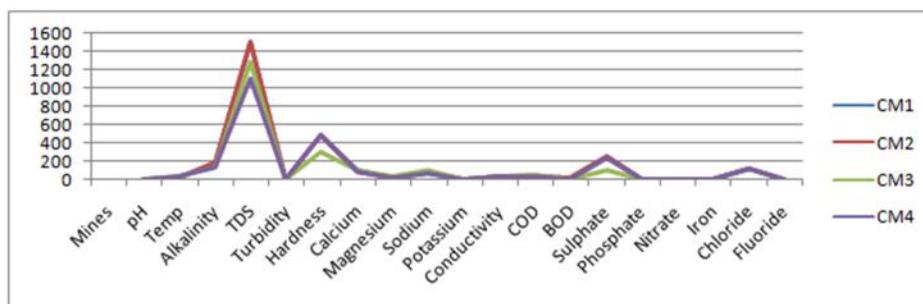


Figure9. Variation of various parameters of 4 coalmines : post-monsoon 2012



IV. Result and Discussion

The overall statistical data for 2010-2012 indicated the mean value of Magnesium, Sulphate, Nitrate, Chloride were within desirable limit and considered under safe category. The content of Alkalinity, TDS, Hardness, Calcium, Iron, Fluoride were between desirable and maximum permissible limits and hence samples were marginally safe with respect to these parameters. The results indicated that water samples from discharge points of given coalmines could not be consumed directly as it is unsuitable for drinking purpose in accord to WHO 1993, Indian standards for drinking water IS: 10500[24]. But no parameters were beyond maximum permissible limit except BOD and COD, the water as such could be used for purpose like dust suppression, road cleaning, spraying etc. Few observations of Suspended solid content found much beyond the permissible limit but the mean values were within the limit.

V. Conclusion and Proposed Preventive Measures

Although no water sample investigated found unsafe but considerably marginally safe indicates contamination of available discharged water. The extent of contamination is a matter of concern. The primary, secondary and tertiary treatments are to be applied on mine water to remove the excess quantity of Total dissolved solids, Chemical oxygen demand, Biological oxygen demand, Sodium, Sulphates, Hardness, Alkalinity, Chloride and Calcium. But the mean values of all parameters were within maximum permissible limit and indication of contamination of water is a part of concern.

The polluted water could be prevented from contamination by preparing garland drains at two stages. One set of garland are made ahead of mining activities such that rain water is diverted to water resources before entering into the mine and getting contaminated. The second stage of garland drains could be made inside the pit between overburden and mine faces to prevent contaminated water entering into the mine area[10]. Also, mine water can be pumped to a lagoon, which acts as a sedimentation pond. The overflow water, which is fairly clean, is drained out to natural drain or used for dust suppression activities. Water pollution could be controlled by carefully separating the water runoff from undisturbed areas from water which contains sediments or salts from mine workings. Clean run-off can be discharged into surrounding water courses, while other water is treated and can be reused such as for dust suppression and in coal preparation plants[11]. Underground mine water originates from a combination of catchment water in the open pit and natural groundwater infiltration which could be recycled for use as wash down water in maintenance shops, drill water underground, dust control on surface roads and dust control from the crusher exhaust stacks. Excess mine water could be treated to meet the needs of premises[12].

The treatment of mined out water is very essential as its direct consumption can lead to various health effects. The enlisted treatments [23,24] with respect to various parameters which are beyond the desired limit are to be applied in order to make the waste water from mines usable. Water hyacinths can be effectively utilized as a viable alternative for treatment of industrial effluents also. The existing waste water treatment plants can also be improved using water hyacinth. Introduction of this weed in the lagoon increases even thousand times purifying capacity of water. It has been observed that nitrogen content of water was reduced by 73% total phosphorous by 65% and organic carbon by 70%. These



lagoons have to be seeded with hyacinth and once the crop develops, effluent from industrial or domestic sources are simply collected from the other end. The cost involved in growing water hyacinth in lagoon is very less. In India this weed can grow extensively due to its hot climate and hence can be utilized to the maximum[13]

But this water could be used for domestic purpose and also accounted for various operations in coalmines like dust suppression, mine cooling, underground sanitation, backfill for ground support, underground workshops etc. The discharged water from coalmines could be allowed to settle for a long span so as to sediment the settleable impurities and then the undisturbed water from sedimentation pond could be collected and used for domestic purposes like public toilets, flushing, plantation, general beautification (fountains, lawns etc), swimming, bathing, cleaning industrial purposes etc. after optimum treatment. In mines where potable water from other sources is not available, water treatment plants can be installed for purifying the mine water and distributing it for domestic use.

In Chandrapur there are seven Treatment plants installed in mining areas for effluent treatment and water treatment .Hence more plants are to be installed so that the mine water could be treated to the maximum and utilized for drinking purpose Worldwide various workers researched on irrigation with gypsiferous mine water. The use of soil amendments, such as gypsum should be considered in conjunction with leaching.[14-19].

VI. Measures to Prevent Pollution of Environment

1. Prevention of ingress of water into the working by grading the surface area around the mine or building channels to collect and divert storm water.
2. Establishment of vegetation on tailing dumps and dam surfaces to prevent erosion, reduce the quantity and improve the quality of rainfall run-off from dump sites.
3. Storage of mine water in evaporation areas.
4. Recycling of water from tailing dams
5. Utilization of mine water for cooling and by selected industries which can tolerate low quality water[20].
6. A systematic study of pollution level of villages around the mining areas in Chandrapur town (Within 20 Km belt from Coal-mines) to assess the quality of environment.
7. Extensive rain water harvesting to protect the existing sources should be implemented.
8. Extensive forestry programs.
9. Spraying of water should be extensively done to prevent the formation and spread of dust particle.

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STATE ACTIVISM AND ITS CONTROL- CONSTITUTIONAL PROVISIONS IN INDIA

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Introduction

In India, Part IV of the Constitution basically transformed and revolutionized the functions of the state from a police state to a welfare state. To translate this goal into action, in a country like India, the state had to undertake on a massive scale, welfare activities with a multi-pronged drive which must include adequate facilities for education in different systems, employment for unskilled, semi-skilled and skilled workmen, medical relief, old-age pensions, housing, cheap-clothing, making available basic necessities at modest price. However, all the activities of the state or administration are to be performed *intra vires*. In the name of performing their functions, the governmental authorities cannot be allowed to exercise their powers *ultra vires*.

Objective(S)

The main objective of the study is to discuss on the constitutional provisions in India which may be utilized as means of controlling *ultra vires* activities of the state.

Methodology

The study is an analytical one based on secondary data, collected from books, internet etc.

Discussion on the Topic

Due to the adoption of the philosophy of welfare state, there has been tremendous increase in the state activities. It has become necessary to confer discretionary powers on the administrative authorities to meet the emergent situation in the public interest, promptly and efficiently. The discretionary powers conferred on the administration may range from simple ministerial functions like maintenance of births and deaths register to powers which seriously affect the rights of an individual, such as acquisition of property,



regulation of trade, industry or business, investigation, seizure, confiscation and destruction of property, detention of a person on subjective satisfaction of an executive authority and the like. However, in almost all the democratic countries it is well-established that the powers and functions conferred on governmental authority is not unfettered, uncontrolled and non-reviewable by the courts.

In India, where the most-detailed written Constitution of the world is there, the power of judicial review has been accepted as the heart and core of it and is treated as the basic feature of the Constitution and the safest possible safeguard against abuse of powers by the administration and the judiciary cannot be deprived of the same as it was propounded by the Supreme Court of India in several landmark judgements, such as-Keshavananda Bharati v. State of Kerala (AIR 1973 SC 1641) and Minerva Mills Ltd. v. Union of India (AIR 1980 SC 1789) etc. The power of judicial review is the touch-stone of the Constitution of India which has been conferred on the Supreme Court and the High Courts through various provisions of the Constitution i.e., Articles 13(2), 32, 131-136, 141-143, 226 and 227, aiming at protecting the individuals from abuse or misuse of power by the governmental authority. Articles 32 and 226 of the Constitution of India empower the Supreme Court and the High Courts to issue writs in the nature of habeas corpus, mandamus, prohibition, quo-warranto and certiorari against governmental authority for enforcement of fundamental rights of the citizens and also for the enforcement of any other legal rights of the individuals respectively, which has specifically been provided under Article 226 of the Constitution empowering the High Courts to issue writs for this purpose.

In India, the Courts will interfere with the activities of the State in case of---

- (i) Failure to exercise discretion, which may flow from sub-delegation, imposing fetters on discretion by self-imposed rules of policy, power coupled with duty etc.
- (ii) Excess or abuse of powers, which may be inferred from absence of powers, exceeding jurisdiction, non-observance of the rules of natural justice, mala-fide, unreasonableness etc.

Conclusion

After all, the power of judicial review conferred on the Supreme Court and the High Courts through various provisions of the Constitution of India can be regarded as The best and effective means of controlling ultra vires state activism.



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A STUDY OF WOMEN CONSTRUCTION WORKERS WITH SPECIAL REFERENCE TO THEIR OCCUPATIONAL AND HEALTH HAZARDS

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Abstract

Women play a vital role in the unorganized sector and here they are engaged in activities at the bottom end of the scale of the earning income and they are the poorest of the poor of the working class. They are characterized by low wages, low capital intensiveness, low energy etc. In the unorganized sector a significant percentage of women are engaged in construction industry. Wage differentiation, turnover of equal work and the more submissive nature of women are important attraction for the employees to use women in the field. Women workers in the construction site may be exposed to various occupational hazardous that lead to poor health conditions and may increase the risk of accidents. Hence, the present study focuses on occupational hazards of women construction workers which in some instances causes permanent disability or death. The present study was conducted in the working sites in Tirupati Town, Chittoor District, Andhra Pradesh with a total sample of 86 respondents. The results highlighted that these workers are exposed to fatal injuries and accidents in the work places due to improper safety measures. Cough and Breathlessness were the common complaints reported.

Key Words: Unorganized Sector, Occupational Injuries, Hazardous Substances

Introduction

To find women working outside their homes is not a new phenomenon. Women have been participating in economic activities since primeval days to the present. It is believed that from post-Vedic period, however women only of lower strata of society worked outside home. Seeking of employment by women in Plantations, factories and mines started from the early years of present century. After India became independent, the constitution has declared that there should be no discrimination against the employment of women. There was the increasing number of women in work force. This is due to the expansion of sectors of economy that rely heavily on women workers.



Participation of female population in the economic activity has a definite impact on demographic and socio-economic structure of population. Size of female work force is governed not only by the existence of job opportunities, but also by their capacity and willingness to avail them. The socio-cultural set up to a large extent determines the size and nature of female work force. More than the required qualification or the individual's interest, it is the economic status and the socio-cultural background which decide women's participation in the labour force. From the past women are treated as unpaid family workers. They have been assigned traditional roles and not allowed to work outside the home. But in the modern world the work participation rates of women is continuously increasing. They are being employed in organized and unorganized sectors. The unorganized sector would include all unregistered commercial enterprises and all non-commercial enterprises that had no formal structure in terms of organization and operation.

Percentage of Female Main Workers to Total Female Population Under Broad Categories - 1981 To 2011

Census Year	Percentage to Total Female Population				
	Female Main Worker	Cultivators	Agricultural Labourers	Household Industry	Other Workers
1	2	3	4	5	6
1981	13.99	4.65	6.46	0.64	2.24
1991	15.93	5.51	7.05	0.55	2.82
2001	14.68	5.11	4.51	0.95	4.11
2011	15.2	6.13	10.48	1.46	7.45

Source: Office of the Registrar General, India

According to National Commission on self-employed women, the unorganized sector can be classified under the following broad categories, (a) home based producers including artisans and piece-rate workers, entrepreneurs of micro enterprises paid and unpaid family laboureres, (b) petty vendors and hawkers, (c) contract labour and casual labour, (d) domestic helpers, scavengers, washer women, (e) those doing manual work like construction labour and those working in agriculture and other primary sectors, (f) women engaged in processing work in traditional and non-traditional areas. The laws can't be implemented forcefully in unorganized sector and the women workers in this sector remain marginalized both in the impact of development efforts as well as mobilization activities of the more organized trade unions. The working women in the unorganized sector have been the greatest victims of the process of technological changes and of the economic transformation.



Women play a vital role in the unorganized sector and here they are engaged in activities at the bottom end of the scale of the earning income and they are the poorest of the poor of the working class. They are characterized by low wages, low capital intensiveness, low energy etc. The plight of the women workers in the unorganised sector is pitiable what with several loopholes for steady exploitation cashing in on their illiteracy, ignorance and lack of organization. The Indian culture obstructs women's access to jobs in shops, factories, and the public sector, the informal sector is particularly important for women. More women may be involved in undocumented or "disguised" wage work than in the formal labor force. There are estimates that over 90 per cent of working women are involved in the informal sector and not included in, official statistics. The informal sector consists of jobs such as domestic servant, petty traders, artisan, or field laborer on a family farm. Majority of these jobs are unskilled and less paid and do not provide benefits to the worker.

Women in Construction Sector

The construction is the second largest industry after agriculture. It is an expanding and flourishing industry. A large part of the construction labour force in the country consists of unskilled labour. In the unorganized sector a significant percentage of women are engaged in construction industry. Around seven and half million workers in the country both male and female are employed in various forms of building and construction activity. They are mostly rural migrant labour, other landless or share croppers and marginalized land holders. Most of the operations in the construction activity are seasonal and at times involve fluctuations in the employment pattern largely due to climatic conditions. The tasks assigned to the women are carrying sand or bricks, crushing bricks and working on hand pumps. The job of an unskilled worker is more strenuous in construction industry than in other manufacturing industries. The short duration of employment, frequent movement from one site to another makes it difficult for them to have a settled life and stable household. There is usually a short period of unemployment extending to few days or even a few weeks.

Wage differentiation, turnover of equal work and the more submissive nature of women are important attraction for the employees to use women in the field. The sector however, does not guarantee permanent work since it depends upon number of factors such as volume and intensity of construction work, type of work, migration trends, contracts choice, wage rates and manipulations of employers. Despite the un- predictability, hundreds and thousands of women have contributed in the construction of buildings, projects, dams, roads and other monuments of progress.



Characteristics of Construction Industry

- High economic vulnerability due to the combination of irregular and unstable employment and consequent high mobility on the one hand and their utilization only in the lower grade of job on the other.
- High proportion of female labour and frequent employment of whole family and couples.
- Low capacity to utilize existing services because of high mobility, ignorance resulting from migrancy, lack of responsibility of civic agencies towards them as well as poverty, illiteracy etc,
- Low health status particularly harmful to children resulting from hazardous, lead to unsanitary and inadequate working conditions.
- Lack of organization due to mobility and other reasons mentioned above,

Women workers in the construction site may be exposed to various occupational hazardous solvents, sewer gases, welding fumes, radiation, noise and vibration. Frquent exposures to these substances/agents may lead to severe injury, chronic illness, permanent disability or even death. Tiredness and fatigue arising from improper health conditions may increase the rate of accidents. Following are the various occupational injuries to which the women construction workers are exposed;

- The likelihood of skin or eye contact with corrosive/irritating substances;
- The exposure of the workers to hazardous physical agents, e.g., noise, heat and radiation;
- The ergonomic factors, e.g. repetitive tasks and manual handling.
- Both the immediate risks, e.g. being overcome by fumes in a confined space, and the long term health risks, e.g. skin cancer from prolonged contact with pitch may occur.
- There also exists problem when new hazardous substances and physical agents are used and when there is a significant change in the working environment.
- Prolonged work under direct sunlight in summer without precautions may cause heat rashes, heat cramps, heat exhaustion and even heat stroke.
- The problem may be aggravated if impermeable protective clothing is worn when undertaking heavy work or working in an enclosed area with a strong heat source, poor ventilation and high humidity. Examples are removal work for asbestos insulation, underground work and maintenance of boilers.

There is clear sexual division of labour in construction work. All the skilled operations are done by men. The union, the management and the government have to work together for developing skill base technology and



capacity through a planned training scheme. This step will create high confidence level within the women construction works to move ahead.

Review of Research

In the developing countries the informal sector accounts for a major share of employment in India and the informal sector accounts for 58 percent in construction as revealed by National Commission on Labour (1993).

Raman. S. and S.Mookiah (2017) conducted a study on socio-economic status of construction workers in Tirunelveli District. The study brought out that construction workers have been facing lot of problems. They do not have any basic facilities. The welfare scheme for construction workers are not reaching them. They are deprived of then basic rights and they are exploited by the contractors. So there is an urgent need for the protection of construction workers to overcome in their lives.

Gourab Biswas1, Arkajit Bhattacharya and Rina Bhattacharya (2016) conducted a study on occupational health status of construction workers and concluded that workplace injuries are mainly due to improper use of personal protective equipments.

V.G.Vaidya et al (2015) conducted a study on Occupational Health Hazards of Women Working in Brick Kiln and Construction Industry. The results focused that a high level of morbidity in the form of headache, body ache, and problems with vision, cough and breathlessness were observed in both industries. It is strongly recommended to take pollution control measures.

Amrit Abrol et al (2008) conducted a study on the utilization of ante-natal care services along with breast feeding and practices among migrant women construction workers found out that the breast feeding practices were found to be much better and there is wide disparity in maternal and child health indicators in comparison with the national and state averages.

Ram Lakhani (2004) had undertaken a study to assess the occupational health status of women workers in the construction industry by evaluating incidences of occupational health disorders. The study identified various occupational hazards like; headaches, backaches, pain in the limbs, respiratory, eye and skin disorders and noise induced hearing loss etc; there are also problems related to gender-specific stress factors such as sex discrimination and balancing work and family demands, above and beyond the impact of general job stressors such as job overload and skills under utilization.

Objectives of the Study

1. To know the working conditions of women construction workers
2. To identify the physical and psycho-social hazards experienced by the respondents in construction work



3. To identify the types of occupational injuries.
4. To know the influence of working conditions on the health aspects of women construction workers.

Methodology

Keeping in view the scope and purpose of the study, the method of survey is used in the present research. The present study was conducted in the working sites in Tirupati Town, Chittoor District, Andhra Pradesh. Purposive sampling method was used in selection of the respondents. The researcher visited the construction sites in and around Tirupati town and purposively taken the sample depending upon the availability. A total of 86 respondents were selected. The personal information of the sample selected has been collected through the interview schedule developed by the investigator. The collected data was analyzed using percentages and suitable graphical and diagrammatic representation. Male construction workers are excluded from the study.

Findings of the Study

The following tables represents the findings of the study

Table No. 1 Working Hours

Sl. No	Working Hours	No. of respondents	Percentage
1.	Less than 8 hours	-	-
2.	8 hours	-	-
3.	9 hours	58	67.44%
4.	10 hours	16	18.56%
5.	More than 10 hours	12	14.00%
	Total	86	100.00%

It is evident from Table No.1 that a majority 67.44% of the women construction workers work 9 hours per day; 18.56% works 10 hours per day and a least 14.00% works more than 10 hours per day. This shows that majority of the respondents works for 9 hours which is very hard task in construction sites.

TABLE NO. 2 PHYSICAL PROBLEMS DUE TO WORK

Sl. No	Physical Problems at work place	No. of Women construction workers	Percentage
1.	Body Pains	31	36.0%
2.	Skin Allergies	18	21.0%
3.	Back Pain	14	16.0%
4.	Irritation in Eyes	06	7.0%
5.	Head Ache	17	20.0%
	Total	86	100%

The researcher has observed from the study that a majority 36.0% of the women construction workers experience body pains as a result of involvement in construction work and 21.0% complain that they have skin allergies and 20.0%



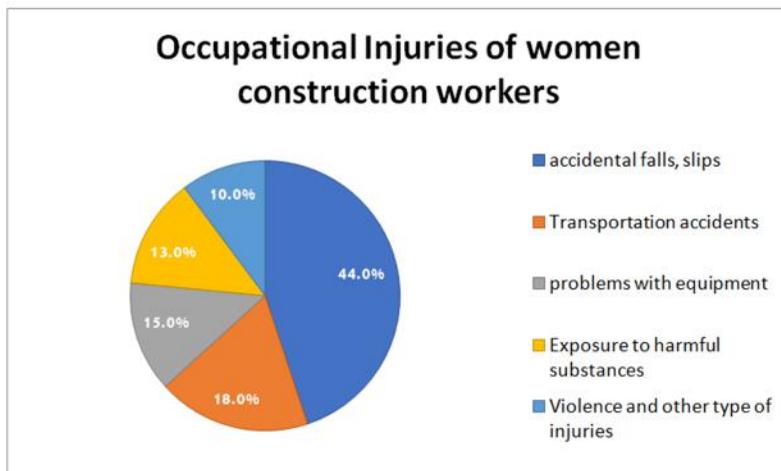
of them suffer with headache. 16.0% of them experience back pain and very few 7.0% of them has irritation in eyes.

Table no. 3 Psycho-Social Hazards at Work Place

Sl. No	Variable	No. of Respondents	Percentage
1.	Gender-based discrimination	29	34.00%
2.	Insecurity of Job	14	16.00%
3.	Problems with small children	10	11.00%
4.	Poor sanitation facilities	12	14.00%
5.	Sexual harassment	15	18.00%
6.	Sexually Transmitted Diseases (STD).	6	7.00%
	Total	86	100.00%

The study highlighted that majority 34.00% of the respondents face gender-based discrimination in the work place; 18.00% of them face sexual harassment; 16.00% of them are struggling with job insecurity; 11.00% of them faces the problem with child’s protection in the work place and a least 7.00% of them are suffering with sexually transmitted diseases. The above problems create tremendous psycho-social hazards among the women construction workers inspite of their poor socio-economic background.

Diagrammatic Representation 4



From the above diagrammatic representation it can be said that 44.0% of the women construction workers are faced with accidental falls and slipping down in the construction area; 18.0% of them are met with transportation accidents; 15.0% of them faces problem with equipment; 13.0% of them are



exposed to harmful substances and a least 10.0% of them are exposed to violence and other type of injuries.

Conclusions

Construction workers have been facing lot of problems. Majority of the them are migrated from the villages to the towns in search of work for their livelihood. Their work nature is tedious and they have to work 9-10 hours a day. They are exposed to different physical, chemical, biological, mechanical, and psychosocial hazards during their daily working schedule. It is observed from the study that due to unconditional work, the women construction workers suffer from body pains, headaches, skin allergies and muscular problems and back pain. These are due to the poor working conditions, manual lifting of weights and lack of rest. These workers are also exposed to fatal injuries and accidents in the work places due to improper safety measures. Cough and Breathlessness were the common complaints reported.

There is a gender discrimination in the payment of wages and this insufficient income retards for good health and safety. Occupational safety hazards in construction might occur due to improper illumination, improper material handling and storage, improper walking and working surfaces, raw concrete surfaces, high platforms, obstructive and unclean floors and aisles, improperly arranged trenches and excavations, badly maintained tools, improper scaffoldings, wrongly designed ladders and stairs, unsuitable and badly maintained lifting appliances, unsafe demolition methods, and insufficient protection against fire and electric hazards. So, there is an urgent need for the protection of construction workers to overcome in their lives. The government has to devise specific measures to the contractors strictly to safeguard the health of the construction workers. Strict implementation of the laws may improve the miserable condition of the workers. The government should devise special plan to provide the basic social conditions for the migrant labour keeping in view the nature of the work.

The women workers at instances were prone to job stresses like sexual harassment, being jobless, gender-based discrimination, proneness to different health hazards, physical problems, insomnia, nausea, headache, and other adverse outcomes. It is seen that at the work place they do not have any privacy for sanitation. They have to bring small children along with them as there is no one back at home to look after them. Both male and female workers work together. Due to free mixing with the male co-workers they are exposed to Sexually Transmitted Diseases (STD).



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PROFITABILITY AND LIQUIDITY ANALYSIS OF SELECTED MNC'S PHARMACEUTICALS IN INDIA

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Abstract

Profitability is a measure of business success. It ensures the financial sustainability of the business and gives the business the capacity to endure. For any business both liquidity and profitability are vital ingredients found in a successful and sustainable business and while related in part, they are usually measured and managed as two separate functions. The study attempts to measure the firm's liquidity, profitability, and other indicators that the business is conducted in a rational and normal way; ensuring enough returns to the shareholders to maintain at least its market value. The pharmaceutical industry is acknowledged as one of the most promising industries in India; therefore this study should make a significant contribution to the practice. The study is based on financials of 15 leading MNC companies (8 Domestic & 7 Foreign) in Indian pharmaceutical sector for which these 15 companies account for around 40 % share of total pharmaceuticals market by value.

Introduction

The purpose of financial analysis is to analyze the information contained in financial statements so as to judge the profitability and financial soundness of the firm. It is just like a doctor examining his patient by recording his body temperature, blood pressure etc. before making his conclusion, regarding the illness and before giving his treatment.

Need for the Study

Now a day's public attention in this country has been focused so much on the profitability and liquidity of corporate finances. Furthermore, only few studies were made on pharmaceutical industry in connection with examining the relationships between liquidity, profitability and financing. However, the Indian Pharmaceutical Industry has been contributing to the social well being of the country by playing a comprehensive role of discovering, developing, and manufacturing and also distributing quality medicines.



Objectives of the Study

- To evaluate the overall financial performance of companies under study by taking into consideration two important aspects of financial performance namely, liquidity & profitability
- To assess the exact financial status of the selected multinational companies by comparing their financial performance of the selected domestic companies

. The study is based on financials of 15 leading MNC companies (8 Domestic & 7 Foreign) in Indian pharmaceutical sector for which these 15 companies account for around 40 % share of total pharmaceuticals market by value.

(i) Sample design:

The study was based on fifteen selected multinational companies in Indian pharmaceutical industry. In this study purposive sampling procedure was followed. The selected Fifteen multinational companies were:

1. Abbott India Ltd. (Abbott)
2. Astrazeneca Pharma India Ltd. (Astrazeneca)
3. Aventis Pharma Ltd. (Aventis)
4. Glaxosmithkline Pharmaceuticals Ltd. (Glaxosmithkline)
5. Merck Ltd. (Merck)
6. Novartis India Ltd. (Novartis)
7. Pfizer Ltd. (Pfizer)
8. Aurobindo Pharma Ltd. (Aurobindo)
9. Cadila Healthcare Ltd. (Cadila)
10. Cipla Ltd. (Cipla)
11. Dr. Reddy's Laboratories Ltd. (Dr. Reddy's)
12. Ipca Laboratories Ltd. (Ipca)
13. Lupin Ltd. (Lupin)
14. Piramal Healthcare Ltd. (Piramal)
15. Sun Pharmaceuticals Industries Ltd. (Sun)

Liquidity Ratio

- Current ratio
- Quick ratio
- Cash & Bank to current assets

Profitability Ratio

- Basic EPS
- PBDIT Margin (%)
- Net Profit Margin (%)
- Return on Net worth (%)



- Return on Assets (%)
- Return on Capital Employed (%)

Statistical Tools

- Multiple regression analysis
- Repeated measures ANOVA

For the above tool, the hypothesis can be framed as follows:

Ho1. The Ratios of companies does not vary significantly among companies belonging to Indian MNC and Foreign MNC groups.

Ho2. The Ratios of companies does not vary significantly among the years for the study period.

Ho3. The Ratios of companies of different groups does not vary significantly between years (No interaction between groups and years).

Findings of the Study

Results of ANOVA

RATIO	Source	Sum of Squares	F	Sig.
Cash and Bank to Current Assets	Between groups	.496	43.531	**
	Between years	.072	.357	NS
	Years vs groups	.316	1.575	NS
Current Ratio	Between groups	3.663	5.160	*
	Between years	14.133	1.461	NS
	Years vs groups	13.274	1.372	NS
Quick Ratio	Between groups	3.460	5.166	*
	Between years	12.925	1.632	NS
	Years vs groups	10.720	1.353	NS
Basic EPS	Between groups	915.605	1.646	
	Between years	16501.371	.672	
	Years vs groups	15013.151	.611	
PBDIT Margin	Between groups	40.547	1.014	*
	Between years	1592.009	2.041	
	Years vs groups	1295.018	1.660	
Net Profit Margin	Between groups	1327.083	.859	
	Between years	160084.150	1.059	
	Years vs groups	136808.793	.905	
Return on Net worth	Between groups	3.395	.094	
	Between years	6306.926	2.986	**
	Years vs groups	1706.345	.808	
Return on Capital Employed	Between groups	48.111	1.698	
	Between years	4796.523	2.580	**
	Years vs groups	2127.781	1.145	
Return on Assets	Between groups	27.422	2.411	
	Between years	2221.585	2.401	
	Years vs groups	950.049	1.027	



Results of Regression

RATIO	R	F	significant
Current Ratio	.575	6.010	**
Quick Ratio	.597	6.738	**
Return on Capital Employed	.381	2.063	NS
Return on Assets	.321	1.400	NS

Suggestion

- The sales performance of Indian pharmaceutical companies is higher compared to Foreign industry. Conversely, the in- depth analysis of profitability ratio reveals that Foreign industry earns higher profit due to their less expenses. Hence, the Indian pharma companies should try to find out the reasons for the following facts: In spite of increased sales, why is their net profit low? How to minimise direct expenses so as to achieve maximum profit?
- Both the Indian and Foreign pharmaceutical companies have failed to adapt to the “rule of thumb” in maintaining liquidity. Hence, both the companies should try to regulate its liquidity position because “below the standard norms” make the company fails to meet its current obligations, while “above the norms” make the funds remains idle.
- Although high gross profit are earned by the Foreign pharmaceutical companies, the study finds that Indian and Foreign companies have equal and low net profit. This may due to the excess of operating and non-operating expenses like research and development expenses, promotional expenses etc. It indicates that both the groups should concentrate to cut down the total expenses which obviously affect their net profit

Conclusion

The growth performance analysis indicates that Indian pharmaceutical study units are higher and better in terms of sales, total income, net profit, and net worth than that of the Foreign study units. However, the liquidity position of both the groups is almost equal and not satisfactory. The debt and credit management policies are also not sound. It may be acceptable for Foreign companies but the Indian companies have to take due care in managing their liquidity position.

While both the group of companies are equal in terms of return on capital employed and return on total assets, the gross profit ratio and net profit ratio of Foreign units are fairly higher. To be a profitable business, a company must have total expenses lower than the gross profit generated by the sales of



products. In this regard, Foreign units are more efficient in profit generation by lowering the cost of running the business. In other sense, it may be stated that Foreign companies get certain expenses expended by their parent companies and so the expenditure on R&D.

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FLOODS & LIVELIHOOD OF DALITS AND MAHADALITS: AN ANALYSIS, 2017 BIHAR FLOODS WITH SPECIAL REFERENCE TO SITAMARHI DISTRICT OF BIHAR STATE

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Ecological degradation is the depletion of natural resources, flora fauna and the green belt. This is due to the population pressure, inappropriate usage of resources or human interference added upon by the excessive use of these resources for infrastructural development. These activities along with burning of fossil fuels and changed land use pattern have led to climate change. This climate change has accelerated natural disasters. India which was once well known for its diverse geography and ecology is now guest to multiple disasters. Bihar is India's most flood prone state along with being vulnerable to drought and earthquake. The major reasons of flooding in Bihar are Deforestation, Embankment, Farrakha Barrage and Climate Change. This insignificant deforestation has led to climate change which results in recurring flood in the state and affecting large number of districts. Since, Dalits and Mahadalits is the most marginalized community, the crisis situation turns them more vulnerable and bring them decade back which render them hopeless. Since this has become a yearly phenomenon, the communities are massively affected. Thus, this paper is an attempt to study how the Dalits and Mahadalits communities of Sitamarhi district of Bihar state are economically affected by flood. This paper is based on primary data collected from the Dalits and Musahar communities using Interview Schedule and through Focussed Group Discussions conducted. This study will help us know how the livelihood of the most vulnerable community is being affected and what challenges they face to adapt themselves in such vulnerable conditions like that of flood. Thus, major suggestions and strategies could be formulated through these findings which could help in better planning for the rehabilitation of these communities.

Key Words: Ecological degradation, Deforestation, SC/ST Communities, Flood.

Introduction

Natural disasters in India, many of them related to the climate change of India, cause massive losses of Indian life and property. Droughts, flash floods, cyclones, avalanches, landslides brought on by torrential rains, and snowstorms pose the greatest threats. Other dangers include frequent summer dust storms,



which usually track from north to south; they cause extensive property damage in North India and deposit large amounts of dust from arid regions. Hail is also common in parts of India, causing severe damage to standing crops such as rice and wheat. India is flood-prone, and extreme precipitation events, such as flash floods and torrential rains, have become increasingly common in central India over the past several decades, coinciding with rising temperatures.

Bihar is India's most flood-prone State, with 76% of the population in the north Bihar living under the recurring threat of flood devastation. According to some historical data, 16.5% of the total flood affected area in India is located in Bihar while 22.1% of the flood affected population of India lives in Bihar. About 68,800 square kilometres (26,600 sq mi) out of total geographical area of 94,160 square kilometres (36,360 sq mi) comprising 73.06% is flood affected. Floods in Bihar are a recurring disaster which on an annual basis destroys thousands of human lives apart from livestock and assets worth millions.

Objectives of the Study

The present study is basically an analysis of the impact of flood on the livelihood of Dalits and Mahadalits. The following are the specific objectives of the study

1. To analyze the Socio demographic profile of the respondents.
2. To find out the livelihood practices of the respondents.
3. To examine the impact of flood on their livelihood.
4. To suggest the measures for the livelihood enhancement of the Dalits and Mahadalits.

Limitations and Scope for Future Research

The study only is limited to the impact of floods on the livelihood of the SC/ST communities. Though flood affects them diversely but all the parameters could not be taken together, therefore the study leaves behind the wider scope for other researchers to analyze other parameters like social, cultural context, role of Dalits and Musahar youths etc.

Delimitations of Study

The universe of study and sample selection, its size, was under the researcher's control. But due to limited financial resources and time and manpower the study was restricted to small sample size.



Research Design & Methodology

- i) **Research Design:** - **Analytical Research design** is used in the present study. As the study majorly assess the impact of flood on the livelihood practices of the SC/ST community.
- ii) **Sample Design:** - The **purposive sampling** is used in the study as there were selected villages which were inhabited majorly by Dalits and Mahadalits. Since, these communities fulfil the study criteria they were purposively chosen.

District	Block	Village Panchayat	Village	Ward No.
Sitamarhi	Barginia	Musachak	M.N. Punarvas	2
			Baluatola	1
		Belganj	Belganj	12
		Barginia	Bedgania	16

- iii) **Sample Size:** - **One ward each from four** villages was included in the study which includes **4 FGDs, and total 40 individuals** were interviewed in the present study.
- iv) **Area of Study:** - The area of study was **Sitamarhi** district which is the one of the worst flood affected district in Bihar, the rural part of which is majorly inhabited by **dalits and Mahadalits**.
- v) **Universe:** -The dalit and Musahar families of the selected wards of 4 villages of Barginia block of Sitamarhi district of Bihar state were the universe of the proposed study.
- vi) **Unit of Study:** - The dalit and Musahar family were the unit of study.
- vii) **Sources of Data Collection:** - Both **Primary & Secondary** sources of data were referred. But the study is purely empirical in nature and secondary sources were only used to build upon the theoretical framework for the study.
- viii) **Tools & Technique of Data Collection:** - The study used various tools and techniques for data collection such as (i) transect walk, (ii) Focus Group Discussions (FGDs) with Women and Children from Dalit and Musahar community etc. Participant observation was the major technique used in capturing and triangulating the produced data.



- ix) **Processing of Data:** - The data produced was edited and coded and later classified and tabulated using SPSS.
- x) **Data Analysis & Interpretation:** - The data was then analyzed using **SPSS package** . The analysis drawn from empirical findings and the theoretical framework established through the reviews was further interpreted.

Area Profile

District Sitamarhi

Sitamarhi district occupies an area of 2,294 square kilometres (886 sq mi) Sitamarhi is located at 26.6°N 85.48°E. It has an average elevation of 56 metres (183 feet). Sitamarhi district is drained by rivers such as Bagmati, Aghwara, Lakhandei (lakshman rekha), Manusmara & few other minor streams. The northern portion of Sitamarhi falls in foothills of himalaya. Here elevation increases as one goes from south to north. The ground is not rocky and there are no mountains. Land is suitable for growing crops. There is no water scarcity as ground water is present. In 1875, a Sitamarhi sub district was created within the Muzaffarpur district. Sitamarhi was detached from Muzaffarpur and became a separate district as of December 11, 1972. It is situated in the northern part of Bihar. The district headquarters is located in Dumra five kilometers south of Sitamarhi.

Impact of flood on the District

The district was severely impacted in 2017 Bihar floods due to the breach in the Embankment of Bagmati river which affected most of the villages and led to massive loss of life and property. The community that was most affected were Dalits. There was massive agricultural damage and loss of thatched house. As per govt. of Bihar data in Sitamarhi almost 22.74 lakh people are affected with a total death of around 47 which counts for 9% of the total declared deaths in the state. The rural part of district is largely inhabited by Dalits and Mahadalits who are devoid of access to livelihood sources as they do not have land ownership. Thus, large proportion of them depends upon daily wages. However, the flood has rendered them wage less as there is no available work in the areas.



Findings of the Study

1.1. Socio- Demographic Profile of the Respondents

The socio demographic profile of the respondents was assessed on the basis of **sex, caste, age group, type of family and their educational qualifications.**

It is important to analyze the socio- economic status of families as it helps in correlating how the families from different demographic background adapt themselves in the flood situation.

76% female respondents and 24% male respondents from 4 wards were interviewed of which 40% belong to dalits and 60% were Mahadalits i.e. Musahars. 64% of the families were joint having their parents with them but financially all were from the lower income group and majority of them were BPL. Educationally the families were illiterate and their children hardly possess the primary education.

The poor educational status of the families and their financial status is a vicious circle of poverty which depicts the vulnerability of the Dalits and Mahadalits families.

1.2 Livelihood Practices of the Community

The major sources of livelihood in the communities had been agriculture and daily wage labour and livestock produce is used only for self consumption apart by Yadav's (OBC) who have livestock as their main source of livelihood. Most of the households are engaged in shared cropping, and majority of Musahars who form the major proportion of rural population in Bihar are basically dependent upon daily wages. HHs generally have a low milking cows thus, livestock produce is used in their own daily use, this helps in reducing their dependency on markets. Migration is one predominant feature of the disaster affected area in Bihar. On an average 1 person each HH is engaged in working in different cities or in Nepal as wage worker. This is seasonal and generally during the flood season.

Reason for shared cropping or Daily Wages dependency: Since, the dalits and mahadalits community lack land ownership and also are unskilled for performing different tasks added upon my poor capital. These people are left with the meagre option to do daily wage work which is all seasonal in nature. And small number of families practice shared cropping (i.e. cultivating crop on others land and giving half a ratio of production in turn). The poor and low status of mahadalits make them further vulnerable. Thus, very few of the families migrate to different cities to earn and others remain fully dependent upon wage work.



1.3 Impact of flood on the Food Security, Nutrition & Livelihood

Food security has deteriorated in all the affected areas, and is particularly worrying in rural areas, where close majority of population have reduced access to food and close to half have poor diet diversity. A major concern for both immediate and longer term food security are widespread losses of crops and the other livelihood sources.

There is large scale loss of food stocks and agricultural assets. The rural HHs generally have grain banks as traditional practice to mitigate flood impact. However, this high intensity flood has even destroyed the grains in the flood resilient grain banks. Thus, the present coping strategy of the families are such as reducing the size or number of meals consumed, taking loans from the mahajans or business mans in the town at high interest. Overall loss of income, from lost assets, savings and reduced opportunities to be paid for daily labor has reduced the families purchasing power to provide quality meals in sufficient quantity.

Of all the communities the Dalits and Mahadalits have been most vulnerable, as they did not fall into the category of victims who lost their livelihood (as were majorly dependent upon daily wages) . Thus, they did not get the compensation. Since, the assessed villages were at a lower land and was fully submerged in flood water, there was tremendous loss of livelihood sources, food items along with the Non- food items.

Food stock availability: The disaster has hit the shelters the hardest causing the damage to food stock as well. As a result 50% of the HH's had stock left for less than 1 week and 50% had it sufficiently for 1- 3 weeks. The community reported that rice, masoor dal and maize are their staple food. The available food stock was also received by the community through the govt. agencies during relief from the govt. and different relief agencies, as reported. Also, the PDS is functional but the quantity received is not sufficient to last for 1 month. However, in 25% of the assessed wards in village ration through PDS was not accessible as the godown where PDS ration was kept was also affected during flood. Thus, these wards had acute shortage of food and is highly indebted. During the FGDs and discussions with the dalits and mahadalits it was also acknowledged that the diet of the rural folks is high as these people are involved in intensive labour work.

Damage to livelihood sources: The predominant source of income for dalits and mahadalits that is daily wages is lost as the agriculture field in which they worked is destroyed and thus, harvesting season do not provide them income



opportunity. Additionally, the crop is also fully destroyed which made them doubly at loss, because as per the government assessment policy they did not own the land, thus, compensation was not received by the real losers. 44% of the HHs practicing shared cropping lost 100% of their crop. Therefore, they are trapped in the repeating vicious circle and become more socially and economically backward.

Damage to seeds: Almost 75% of the assessed wards practicing agriculture reported complete loss of agricultural seeds during flood. Adding to this the community reported that they are highly indebted due to loss of crop during flood and now again they will have to take loan on high interest rates to buy the seeds. 23% HH lost agricultural seeds. Damage to seeds has become a critical obstacle in restoration of agricultural process by the affected households. Few HHs have sown seeds by borrowing money from mahajans at high interests or through the amount received by the women SHGs under Jeevika.

Moreover, the HHs are seen growing roof top vegetables like bottlegourd, pumpkins etc. for daily consumption as they can't include other vegetables due to insufficient land.

Damage to Livestock: Almost 32 % of HHs had livestock prior to disaster and only 11% of HHs lost the livestock. Livestock rearing is not very widely practiced in the assessed areas, and wherever found is not used as main source. As the community is not much informed on the advanced livestock management process for commercial production.

Apart from this, the milk production has reduced to 14 % from the cows due to unavailability of fodder. It was reported by the community that many cows and young calf died due to lack of fodder. Thus, in present the HHs are not able to get enough produce for self consumption. 21% of HHs having livestock have fodder availability for less than 1 week. Most of the cattle sheds are partially or fully damaged. And thus, the community who received the tarpaulin sheets are using the small one for covering the cow sheds. The major livestock found are cow, buffalo and goat, and very few HHs practice Poultry and piggery.

Damages to livestock shelters, death and malnutrition and the risk of diseases among the surviving livestock due to insufficient feed, fodder and animal health support could largely affect the productivity of the livestock affecting production of meat and milk products.

Markets: Markets are reported to be largely functional in many of the areas in townships, as reported by Govt. and observed during the study. However, in



remote areas the water force has badly affected the roads. In Sitamarhi, the rural roads are highly damaged, many villages have lost the connectivity and thus, big vehicles are not able to enter in those areas. Community has to walk two kms to take the public conveyance from the chauraha. In the rural areas within the village only 3-4 petty shops of biscuits, chips, some daily HH items etc could be seen. Apart from this there is biweekly market organized in the common land. It was acknowledged that the purchases are made by males in majority of the HHs and those HHs where the males have migrated for work, the women manages the purchases.

Role of Government & other CBOs: - The government and the local community volunteerism including local manchs like – marwari manch, youths from schools etc. distributed the raw food pkts. and also the cooked food. Even as per the government orders the food stock under MDM was started for community during flood.

Conclusion

Excessive human activities have led to global warming which in turn increased the frequency of Natural disasters. As a result of which India has fallen prey to increasing number of different disasters. This study was an analysis of Bihar 2017 floods in which the impact of flood on the livelihood of the Dalits and Mahadalits has been studied. It is concluded from the above findings that the Sitamarhi district is highly affected and its rural parts are doubly vulnerable due to its geography and demography. Since the area is largely inhabited by Dalits and Mahadalits who are badly engulfed in the vicious circle of poverty. They have no livelihood options when affected by flood and remain devoid of income sources for longer term until they start getting the wage work. Thus, this affects them economically which influences them further on the social front. They remain at the back foot in utilizing all the educational opportunities and health facilities due to ignorance.

Recommendations for the Livelihood enhancement of the Dalits & Mahadalits

- ✓ Ensuring the relief being received by the eligible victims.
- ✓ Change in the assessment policy of the government.
- ✓ Cash for Work to be initiated by the government soon after flood to prevent migration and stop the expected increase in crime rates post disaster.
- ✓ Quantity of PDS to be increased post disaster to maintain the stock availability with the flood affected victims and prevent them from hunger.
- ✓ Ensuring the government landownership of all Dalits and Mahadalits so that they have permanent livelihood option.



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DESIGN OF CYLINDER FIN BODY USING DIFFERENT FIN PROFILES OF HERO HONDA PASSION

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Abstract:

The Engine cylinder is one of the major automobile components, which is subjected to high temperature variations and thermal stresses. In order to cool the cylinder, fins are provided on the cylinder to increase the rate of heat transfer. By doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation inside the cylinder.

. The main aim of the project is to Design cylinder fins. Materials used for cylinder fin body are Aluminum alloys.

Parametric models of cylinder with fins have been developed to predict the transient thermal behavior. The 3D modeling software used is Pro/Engineer.

Pro/engineer is introduced by PTC Company. PTC means Parametric Technology Corporation.

We also design that Part using Reverse Engineering Process. And also we study what type of cooling systems and what are the modules used for designing. We know that what is the Importance for Designing and what the methods used for Manufacturing.

In this paper we are changing the fin section from straight section to curvature section and Taper section also calculate the heat dissipation rate.

In this we are know the Procedures in Manufacturing. Now days we are using Aluminum for Manufacturing because it's lower weight.

Analysis is done in Solid works. Solid works is 3D Modeling and Simulation Software.

Analysis is done in COSMOS Module.

1. Introduction

An extended surface (also known as a combined conduction-convection system or a fin) is a solid within which heat transfer by conduction is assumed to be one dimensional, while heat is also transferred by convection from the surface in a direction transverse to that of conduction.

Heat transfer is classified into three types. The first is conduction, which is defined as transfer of heat occurring through intervening matter without bulk motion of the matter. A solid has one surface at a high temperature and one at a lower temperature. This type



of heat conduction can occur, for example, through a turbine blade in a jet engine. The outside surface, which is exposed to gases from the combustor, is at a higher temperature than the inside surface, which has cooling air next to it. The second heat transfer process is convection, or heat transfer due to a flowing fluid. The fluid can be a gas or a liquid; both have applications in aerospace technology. In convection heat transfer, the heat is moved through bulk transfer of a non-uniform temperature fluid. The third process is radiation or transmission of energy through space without the necessary presence of matter. Radiation is the only method for heat transfer in space. Radiation can be important even in situations in which there is an intervening medium; a familiar example is the heat transfer from a glowing piece of metal or from a fire. Convective heat transfer is between the surfaces and surrounding fluid can be increased by providing the thin strips of metal called fins. Fins are also referred as extended surfaces. Whenever the available surfaces are inadequate to transfer the required quantity of heat, fins will be used. Fins are manufactured with different sizes and shape depends on the type of application. Air cooling for an IC Engine is well known example for Air cooling system in which air acting as a medium. Heat generated in the cylinder will be dissipated in to the atmosphere by conduction mode through the fins or extended surfaces

are used in this system, which are incorporated around cylinder.

We know that in case of Internal Combustion engines, combustion of air and fuel takes place inside the engine cylinder and hot gases are generated. This is a very high temperature and may result into burning of oil film between the moving parts and may result it seizing or welding of same. So, this temperature must be reduced to about 15-20 °C at which the engine will work most efficiently. Too much cooling is also not desirable since it reduces the thermal efficiency. So, the object of cooling system is to keep the engine running at its most efficient operating temperature. It is to be noted that the engine is quite inefficient when it is cold and hence the cooling system is designed in such a way that it prevents cooling when the engine is warming up and till it attains to maximum efficient operating temperature, then it starts cooling. To avoid overheating, and the consequent ill effects, the heat transferred to an engine component (after a certain level) must be removed as quickly as possible and be conveyed to the atmosphere. It will be proper to say the cooling system as a temperature regulation system. It should be remembered that abstraction of heat from the working medium by way of cooling the engine components is a direct thermodynamic loss.

Therefore, all heat engines require cooling to work. Cooling is also



required because high temperature damage engine materials and lubricants. Internal-combustion engines burn up fuel hotter than the melting temperature of engine equipment, and hot adequate to set fire to lubricants. Engine cooling removes energy quick enough to keep temperatures low so the engine can survive.

Moreover, fins are also utilized in cooling of large heat flux electronic devices as well as in cooling of gas turbine blades. Fins are also used in thermal storage heat exchanger systems including phase change materials. To the best knowledge of the, fins as passive elements for enhancing heat transfer rates

It is seen that the quantity of heat given to the cylinder walls is considerable and if this heat is not removed from the cylinders it would result in the resignation of the charge. In addition, the lubricant would also burn away, thereby causing the seizing of the piston. Excess heating will also damage the cylinder material. Keeping the above factors in view, it is observed that suitable means must be provided to dissipate the excess heat from the cylinder walls, so as to maintain the temperature below certain limits. However, cooling beyond optimum limits is not desirable.

1.2 Objectives of the project

The following are the main objectives of the present work:

- To design cylinder with fins for a 150cc engine by varying the geometry

such as rectangular, Taper and curve shaped (parabolic) and thickness of the fins.

- To determine transient thermal properties of the proposed fin models.
- To identify suitable alloy for the fabrication based on results obtained from finite element analysis and analytical method

1.3 Fin Parameters.

Sl. No	Parameter	Forms
1.	Type of Fins	1. Rectangular 2. Circular 3. Taper
2.	Thickness of the fin	1. 2 mm

Table-1 Types of fins used in our project.

2. Literature review

2.1 Hardik D. Rathod et al., it is important for an air-cooled engine to utilize fins for effective engine cooling to maintain uniform temperature in the cylinder periphery. Many experimental works has been done to improve the heat release of the cylinder and fin efficiency. In this study, heat release of an IC engine cylinder cooling with straight fins and with wavy fins is calculated numerically using commercially available CFD tool ANSYS. The IC engine is initially at 500°C and the heat release from the cylinder is analysed at a wind velocity of 60 km/hr to 100 km/hr. The heat release from both the cylinders is compared. With the help of the available numerically results, the design of the I. C. engine cooling fins can be modified



for improving the heat release and efficiency

Heat transfer coefficient can be increased by increasing the surrounding fluid velocity by forced convection. Heat transfer dependence on different stream velocities. But higher velocities also lead to lower heat transfer. So it is necessary to maintain fluid velocities around the fins.

2.2 KM Sajesh et al., All Engines have cooling mechanism to remove the heat from the engine, some heavy vehicles use water-cooling system and almost all two-wheelers use air-cooled engines, because air-cooled engines are only option due to some advantages like lighter weight and lesser space requirement. In engine when fuel is burned heat is produced. Additional heat is also generated by friction between the moving parts. Only approximately 30% of the energy released is converted into useful work. The remaining (70%) must be removed from the engine to prevent the parts from melting. For this purpose the heat generated during combustion in IC engine should be maintained at higher level to increase thermal efficiency, but to prevent the thermal damage some heat should be removed from the engine. In air-cooled engine, extended surfaces called fins are provided at the periphery of engine cylinder to increase heat

transfer rate. That is why the analysis of fin is important to increase the heat transfer rate.

3. Aim of our Project

Aim of our project is Heat transfer analysis and optimization of engine cylinder fins of varying geometry and materials. In this project we mainly studied on how to effectively design the fins of the cylinder and studied on the analysis of the behavior of the fins by changing, geometry of the fin. Analysis is also done by varying the materials of fins. In this work we used material for cylinder fin body is Al alloy 6061. Our destination is to find the material which gives better heat discarding without damaging the performance of the engine; The main aim of the project is to design and analyze cylinder with fins, by changing geometry of the fin. Analyzation is also done by varying the materials of fins. Present used material for cylinder fin body is Aluminium alloy 6061 which has thermal conductivity of 110 - 170 W/mk. Our aim is to change the material for fin body by analyzing the fin body with other materials and also by changing the thickness. Geometry of fins - Rectangular, Circular and Taper Shaped Thickness of fins - 2mm

Materials used- Aluminium Alloy A2024, Aluminium Alloy 6061, Aluminium Alloy 7075

4. Technical properties of Materials

Thermal Properties	Al alloy(2024)	Al alloy (6061)	Al alloy (7075)
Thermal conductivity	140 W/MK	180 W/MK	130 W/MK
Specific heat	0.434J/g ^o c	0.875J/g ^o c	0.960 J/g ^o c
Density	2.69g/c	2.71g/c	2.81 g/cc

Air

Film coefficient	39.9	39.9	39.9
Bulk temperature	303 K	303 K	303 K
Temperature	500K	550K	550 K

Film coefficient	39.9	39.9	39.9
Bulk temperature	303 K	303 K	303 K
Temperature	500K	550K	550 K

Table-2 Material properties tables.

5. Software's used

Designing software: Pro/Engineer.

Analysis software: Solid Works.

Present material: Aluminium (6061) alloy.

Modified material: Aluminum (2024) alloy and Aluminium Alloy 7075.

6. Introduction to Pro/Engineer

Pro/ENGINEER Wildfire is the standard in 3D product design,

featuring industry-leading productivity tools that promote best practices in design while ensuring compliance with your industry and company standards. Integrated Pro/ENGINEER CAD/CAM/CAE solutions allow you to design faster than ever, while maximizing innovation and quality to ultimately create exceptional products.

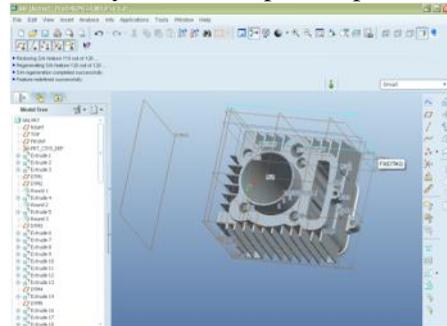


Figure-1 Original Model of fin in Pro/Engineer software

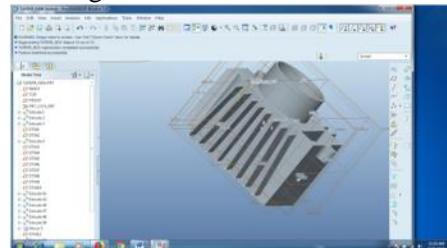


Figure-2 Taper Model of fin in Pro/Engineer software

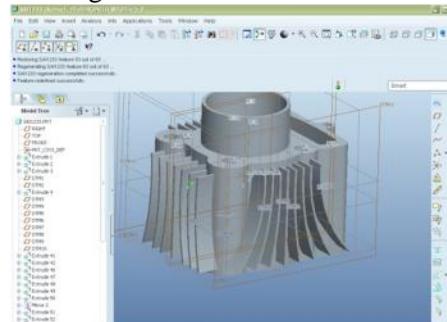




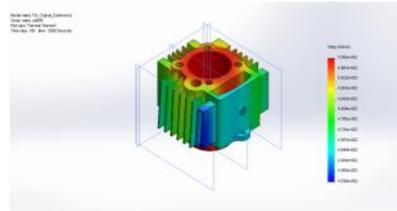
Figure-3 Curvature Model of fin in Pro/Engineer software

7. Analysis images in COSMOS (Solid Works software)

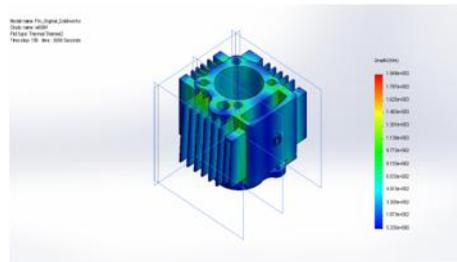
7.1 Transient Thermal Analysis

7.1.1 Aluminium 6061 Present Modal Imported Model

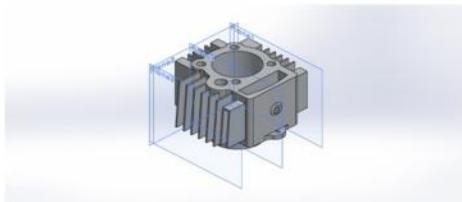
1949.15 K/m Node: 936	5.3347 K/m Node: 10392	GRADN: Resultant Temp Gradient at Step No: 150(3000 Seconds)
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Temperature Gradient

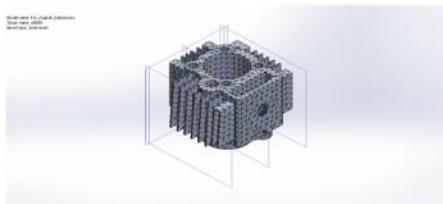


Thermal Flux



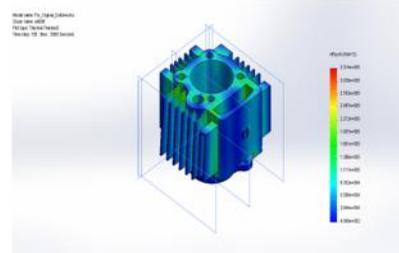
Meshed

Modal



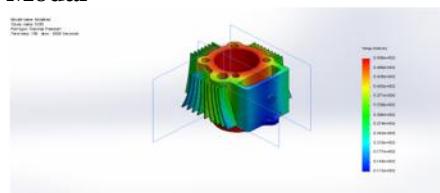
Loads

331355 W/m ² Node: 936	906.899 W/m ² Node: 10392	HFLUXN: Resultant Heat Flux at Step No: 150(3000 Seconds)
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Load name	Load Image	Load Details	Function Curve
Temperature-1		Entity: 178 face(1) Initial Temperature: 300 Kelvin Time variation: on	
Temperature-2		Entity: 1 face(1) Temperature: 300 Kelvin Time variation: on	
Convection-1		Entity: 177 face(1) Convection: 10 W/m ² K Coeff(Con): 20 W/m ² K Time variation: off Temperature: 300 Kelvin Sub Ambient Temperature: 300 Kelvin Time variation: off	

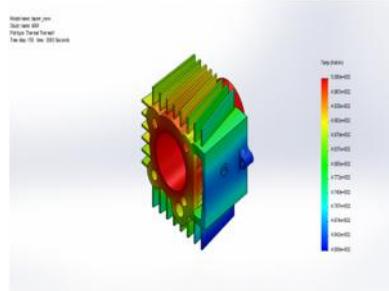
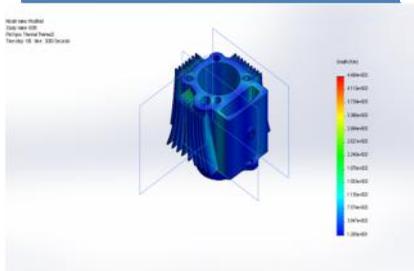
7.1.2 Aluminium 6061 Curvature Modal



7.1.3 Aluminium 6061 Taper Modal

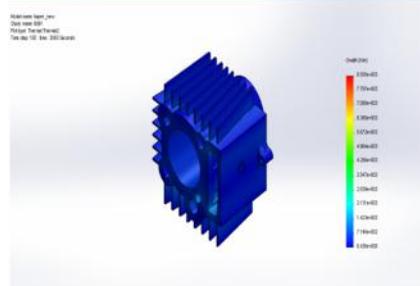
Temperature Gradient

4484.41 K/m Node: 20337	12.0492 K/m Node: 21328	GRADN: Resultant Temp Gradient at Step No: 150(3000 Seconds)
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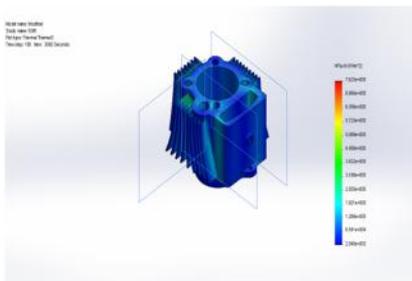


Temperature Gradient

8504.89 K/m Node: 1612	6.43638 K/m Node: 256	GRADN: Resultant Temp Gradient at S No: 150(30 Seconds)
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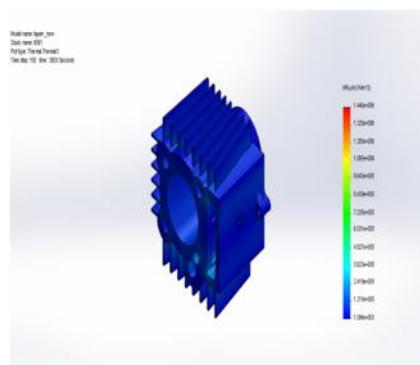


762349 W/m ² Node: 20337	2048.36 W/m ² Node: 21328	HFLUXN: Resultant Heat Flux at Step No: 150(3000 Seconds)
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Thermal Flux

1.44583e+0 06 W/m ² Node: 1612	1094.18 W/m ² Node: 256	HFLUXN: Resultant Heat Flux at Step No: 150(3000 Seconds)
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8. Results

Thermal Flux	Thermal Gradient	Temperature	Original Model
331355 W/m ² Node: 936	1949.15 K/m Node: 936	500 Kelvin Node: 534	Aluminium 6061
332467 W/m ² Node: 936	1921.77 K/m Node: 936	500 Kelvin Node: 534	Aluminium 7075
318104 W/m ² Node: 936	2272.17 K/m Node: 936	500 Kelvin Node: 534	Aluminium 2024

Table-3 Present model results.

Thermal Flux	Thermal Gradient	Temperature	Taper Model
1445830 W/m ² Node: 1612	8504.89 K/m Node: 1612	500 Kelvin Node: 1	Aluminium 6061
1447470 W/m ² Node: 1612	8366.91 K/m Node: 1612	500 Kelvin Node: 1	Aluminium 7075
1425880 W/m ² Node: 1612	10184.8 K/m Node: 1612	500 Kelvin Node: 1	Aluminium 2024

Table-4 Taper model results.

Thermal Flux	Thermal Gradient	Temperature	Curvature Model
762349 W/m ² Node: 20337	4484.41 K/m Node: 20337	550 Kelvin Node: 624	Aluminium 6061
763490 W/m ² Node: 20337	4413.24 K/m Node: 20337	550 Kelvin Node: 624	Aluminium 7075
748567 W/m ² Node: 20337	5346.9 K/m Node: 20337	550 Kelvin Node: 624	Aluminium 2024

Table-5 Curvature model results.

Curvature modified	Taper modified	Original modal	
879	901	971	Aluminium 2024
848	869	936	Aluminium 6061
882	904	975	Aluminium 7075

Table-5 Weight Table

9. Conclusion

In this project we have designed the fin body of Hero Honda as per the parameter varying reverse engineering process

We are taken the fin thickness of original modal as for remaining two cross section of fin is 2mm

In this we are optimize the materials present used material is AL 2024 and replacing materials are AL 6061 and AL 7075

We are doing model analysis using solid works software and designing in PRO/E Software.

Finally, we are comparing all the results for original and modified fin body. The original material for manufacturing fin is Al 6061.

In Aluminium 7075 the heat flux value is more when compared to Aluminium 2024 and Aluminium 6061.

In analysis the Heat flux of Aluminium 7075 for taper model has more heat flux value of 1447470 W/m²
Node: 1612

In calculations by comparing the all values of heat loss by the fin body the taper modified body is better values



comparatively the all values of all models of fin body.

So we have concluded that al 7075 good for weight reduction and heat flux also more.

Finally, we conclude that Aluminium 7075 is used for manufacturing of engine cylinder fin is safer and efficient.

By comparison the weights we decrease the weight of the fin using Aluminium alloys and the weight will be decreased by 100 grams.

In calculations by comparing the all values of heat loss by the fin body the taper modified body is better values comparatively the all values of all models of fin body

10. References

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BIOCHAR PRODUCTION USING PYROLYSIS COOK STOVE FROM COFFEE HUSK, WOOD WORKING WASTES AND WASTES FROM BEDELE BREWERY

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Abstract

Ethiopia has different biomass resource for biochar production, through Pyrolysis cook stove co-producing biochar. Coffee husks are the major solid residues from the handling and processing of coffee in the study area. This study was to evaluate the biochar co-producing pyrolysis cook stove with respect to heat transfer.

The issues of clean and improved energy access for domestic, institutional and industrial usage are of utmost concern to citizens, governments and international organizations globally. In Ethiopia bulk of energy supply is met from wood fuels (firewood and charcoal) which accounts for numerous of total primary energy supply and many of the final energy demand with its negative health and environmental impact. Additionally, due to scarcity of fertilizer, increasing costs of fertilizer on the market and wastes from coffee husks and wastes from Bedele Brewery pollute environment critically; it threatens and disturbs the community of Ilu-Aba-Bora Zone and its surroundings seriously producing of biochar from those wastes and using of scaled up of pyrolysis cook stove is one of the solution of problem listed above.

The methodology we used was: studying feasibility of wastes coffee husk and wastes from Bedele Brewery, Designing scaled up of pyrolysis cook stove, Finding necessary materials on the market and implementing of pyrolysis cook stove in our laboratory.

The pH of biochar solution depends on the pyrolysis condition and the type of feedstock. It was observed that the pH of the biochar increases with charring time, but because of difference in stove geometry, the rate of increment is also different. Heating with high temperature gave pH that is more alkaline than that of the low temperature heating case. Due to the difference in feedstock,



the pH of the biochar made of sawdust was more acidic than the other two. Comparing wastes from Bedele Brewery and sawdust biochar, more pyrolysis gas was noticed in sawdust biochar, which makes the pH low.

Key words: Biochar, coffee husk, Temperature

Introduction

For domestic energy – fuel sources biomass such as wood, animal dung and agricultural waste that are normally burned in traditional stove is used by the developing world. Diverse biomass resource is found in Ethiopia which can be used for energy through pyrolysis cook stove co-producing biochar. Specifically, coffee husks are the major solid residues from the handling and processing of coffee in the study area. The purpose of this study is to evaluate these Biochar producing pyrolysis cooking stove with respect to energy and emission. The selection of the stove design was made from both allothermal and autothermal type of pyrolysis cook stove [13].

Biochar is a fine-grained and porous form of charcoal that is specifically made for use as a soil improver. Added to soil, it can help to boost soil health, with positive benefits to plant growth and disease resistance. It combines a rediscovery of ancient Amazonian fertility-building techniques with a British gardening and turf-building tradition of using 'horticultural charcoal.' It is now the subject of academic research which will establish its potential to support reduced fertilizer use, reduced irrigation and increased yields. Because it supports higher levels of microbiological populations it can be a particularly valuable soil amendment for organic growers. It remains in the soil for centuries. It is therefore an investment in long-term fertility. The benefits of an initial application to soil structure and fertility increase over the years. pollution from waste and use of fossil fuels [16].

Jimma University, Jimma Institute Technology (JiT), Kito Furdisa Campus currently generates approximately 33,902 Kg/month of food waste and kitchen waste by the on-campus dining halls. Production of dining hall and kitchen wastes are seasonal, as food preparation needs decrease significantly in mid of July and August. This waste provides a significant potential source for feedstock energy and in anaerobic digestion processes. These wastes also should be an acceptable feedstock for the anaerobic digestion process [9].

Methodology



Balance



Thermometer



Moisture content detector



Drying oven machine

Fig.1 lists of materials

This research is done at Mettu University, Mechanical Engineering Laboratory located or $8^{\circ} 13' 43''$ N and $35^{\circ} 37' 43''$ E respectively. It is located in Mettu town, Oromia region, south western in Ethiopia.

Stove Description

The Anila stove is a simple technology for converting biomass to char at household level. The stove has been designed and built by Dr. Ravi Kumar of the Mysore University in India. The stove consists of two metal barrels.

Fig.2 Anila stove



The height of the stove is determined based on the rate of natural draught by the stack height and is decided by the relation given in Equation (1).

$$q = CA\sqrt{2gH\frac{T_i - T_e}{T_e}}$$

Where: q = flue gas flow rate (m^3/s), A = cross sectional area (m^2), C = discharge coefficient, g = gravitational acceleration (m/s^2), H = height of chimney (m), T_i = average temperature inside chamber (K), T_e = external temperature (K).

The discharge coefficient is based on the discharge coefficient for subsonic flow through a round orifice (0.6 to 0.65). the average temperature inside the chamber is the average temperature of flue gas during combustion.

Determination of moisture content

Tests were done on the stove to assess the water boiling and the char quality. The fuel efficiency and water boiling tests were done. The stove boiled five liters of water in 9 minutes and the fuel efficiency was 62%.

After the water boiling test was completed, the biomass turned into biochar. The pyrolysis rate was 0.0475 kg/min. The char was tested and found to be rich in carbon with a Ph of 8. The results conclude that the biochar produced is of good quality and it was burnt at very high temperature.

The moisture content of the samples was determined using the oven drying method. Pre weighed samples were dried in the oven at 150 °C for 2 hours and 1041g of mass of plate we have used for wood, saw dust and coffee husk. But for wastes from Bedele Brewery Pre weighed samples were dried in the oven at 200 °C for 6 hours for three days and 1041g of mass of plate we have used. Moisture content was calculated using equation below.

$$\text{Moisture content} = M_{\text{initial}} - M_{\text{Final}}$$

Where, M_{initial} is the mass of the sample before drying and M_{Final} is the mass of the sample after drying.

Biochar pH

Standardized product definition and product testing guidelines for biochar use in soil developed through International Biochar Initiatives were used for biochar testing. Each produced biochar was mixed and samples was taken. Biochar pH values were obtained using a ratio of 1.0 g of biochar in 20 mL deionized water with shaking for 1.5 h, using a shaker to ensure sufficient equilibration between solution and biochar surfaces.

The pH of biochar solution depends on the pyrolysis condition and the type of feedstock [13]. From Figs. below, it was observed that the pH of the biochar increases with charring time, but because of difference in stove geometry, the rate of increment is also different [21]. Heating with high temperature gave pH that is more alkaline than that of the low temperature heating case [19]. Due to the difference in feedstock, the pH of the biochar made of sawdust was more acidic than the other two. Comparing wastes from Bedele Brewery and sawdust biochar, more prolysis gas was noticed in sawdust biochar, which makes the pH low [19].



Fig. 3 Biochar production by pyrolysis cook stove



Fig. 4 Biochar produced

Table 1 The relation of PH of coffee husk with respect to time taken

Time (hr)	0	0.5	1	1.5
PH	7.8	8.1	9.4	9.2

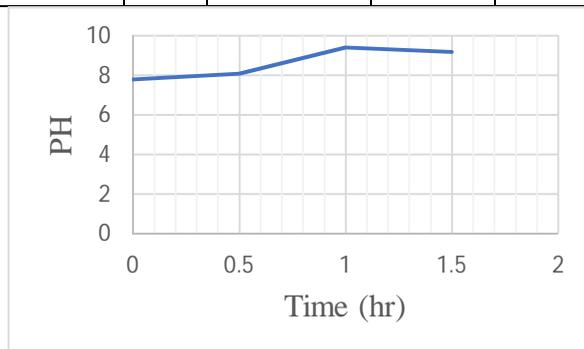


Fig. 5 The relation of PH of coffee husk with respect to time taken



Table: 2 the relation of PH of sawdust with respect to time taken

Time (hr)	0	0.5	1	1.5
PH	5.4	5.2	5.8	6.0

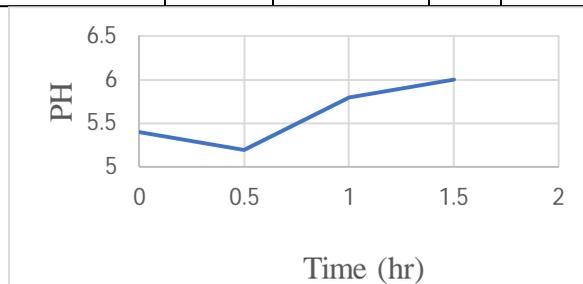


Fig.6 The relation of PH of sawdust with respect to time taken

Table: 3 the relation of PH of wastes from Bedele Brewery with respect to time taken

Time (hr)	0	0.5	1	1.5
PH	8.0	9.0	10.2	10.6

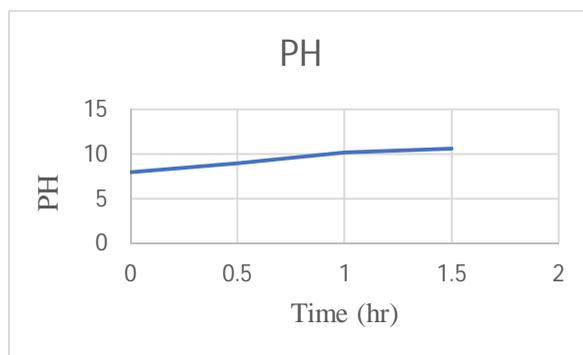


Fig. 7 The relation of PH of wastes from Bedele Brewery with respect to time taken

Due to the difference in feedstocks, the pH of the biochar made of sawdust was more acidic than the other two. Comparing wastes from Bedele Brewery and sawdust biochar, more prolysis gas was noticed in sawdust biochar, which makes the pH low. The pH of biochar solution depends on the pyrolysis condition and the type of feedstock [13]. From Figs. 12-14, it was observed that



the pH of the biochar increases with charring time, but because of difference in stove geometry, the rate of increment is also different [21].

Conclusion

Standardized product definition and product testing guidelines for biochar use in soil developed through International Biochar Initiatives were used for biochar testing. Each produced biochar was mixed and samples was taken. Biochar pH values were obtained using a ratio of 1.0 g of biochar in 20 mL deionized water with shaking for 1.5 h, using a shaker to ensure sufficient equilibration between solution and biochar surfaces.

The pH of biochar solution depends on the pyrolysis condition and the type of feedstock. It was observed that the pH of the biochar increases with charring time, but because of difference in stove geometry, the rate of increment is also different. Heating with high temperature gave pH that is more alkaline than that of the low temperature heating case. Due to the difference in feedstock, the pH of the biochar made of sawdust was more acidic than the other two. Comparing wastes from Bedele Brewery and sawdust biochar, more prolysis gas was noticed in sawdust biochar, which makes the pH low.

Wastes from Bedele Brewery Pre weighed only one samples in redundancy were dried in the oven at 200 °C for 6 hours for three days and 1041g of mass of plate we have used. Temperature reading and time taken during firing and producing biochar from Coffee husk, sawdust and wastes from Bedele Brewery by pyrolysis cook stove we have used 1000g of mass of wood and 3 L of water for boiling it.

Recommendation and Future Work

This pyrolysis cook stove technology can be sustained using local available resources such as sheet metals, wood and manpower for day-to-day operation of the technology. From experimental results it has been observed that there was loss of energy from the firing and at the bottom manufactured pyrolysis cook stove needs for other improvement for getting free air and best combustion. Therefore, it needs to do further work to improve the how improve the firing system of this pyrolysis cook stove especially, at its bottom part for best combustion system and to safeguard the environment and improve the well-being of the people.

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FEASIBILITY ASSESSMENT AND DESIGN OF BIOGAS DIGESTER FROM METTU UNIVERSITY STUDENT CAFETERIA KITCHEN WASTE

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Abstract

In our university we have one students' cafeteria kitchen where daily a large amount of kitchen waste is obtained which can be utilized for better purposes. Biogas production requires anaerobic digestion. Biogas usually contains about 55-65% methane, 30-35% carbon dioxide, and traces of hydrogen, nitrogen and other impurities. Kitchen wastes mettuniversity about 700kg of wastes is assessed within a week and biogas plant of 12.85m³ volumes is designed and also total biogas produced is calculated 6.25m³ / day. This gas produced using energy conversion gives us 39.93kwh of power per day. We have done an Experiments using small scale up digester in the laboratory. The Experiment contains fresh cow dung, kitchen waste. According to data collected for 7 days; 700 kg of kitchen wastes measured. Totally a 100kg/day kitchen waste was measured. By addition of 25% of cow dung we get total waste for design we obtain 875kg and 125kg/day. Project was to create an organic processing facility to create biogas which will be more cost effective, eco-friendly, cut down on landfill waste, generate a high-quality renewable fuel, and reduce carbon dioxide & methane emissions. Kitchen (food waste) was collected from student's cafeteria kitchen feedstock for our reactor which works as anaerobic digester system to produce biogas energy.

Keywords: Biogas, Kitchen waste, Digester

INTRODUCTION

Due to scarcity of petroleum and coal it threatens supply of fuel throughout the world also problem of their combustion leads to research in different corners to get access the new sources of energy, like renewable energy resources. Solar energy, wind energy, different thermal and hydro sources of energy, biogas are all renewable energy resources. It is a process of natural decomposition (digestion) of any organic substance of animal or plant origin due to the activity of anaerobic bacteria, that function in a biogas is composed of methane, carbon

dioxide, water vapor and may have small amounts of other gases like hydrogen sulphide and nitrogen. But small scale biogas is distinct from other renewable energies because of its characteristics of using, controlling and collecting organic wastes and at the same time producing fertilizer. Small scale Biogas does not have any geographical limitations nor does it require advanced technology for producing energy, also it is very simple to use and apply. Deforestation is a very big problem in developing countries like Ethiopia, most of the part depends on charcoal and fuel-wood for fuel supply which requires cutting of forest. Also, due to deforestation it leads to decrease the fertility of land by soil erosion. Use of dung, firewood as energy is also harmful for the health of the masses due to the smoke arising from them causing air pollution. We need an ecofriendly substitute for energy. Kitchen waste is organic material having the high calorific value and nutritive value to microbes, that's why efficiency of methane production can be increased by several orders of magnitude as said earlier. It means higher efficiency and cost of biogas production is reduced.

METHODOLOGY AND DESIGN

Kitchen waste is organic materials having the high calorific value and nutritive value to microbes, which increases the efficiency of methane production. Kitchen waste is any food substance raw (or) cooked, which is discarded in the kitchen. kitchen waste is an untapped energy source that mostly ends up rotting in landfills, thereby releasing greenhouse gases into the atmosphere which causes diseases like Cholera, Malaria, Typhoid. Hence a proper kitchen waste management strategy needs to be devised to ensure its eco-friendly and sustainable disposal.

Source of kitchen waste

The waste used in this study is collected from Mettu University of students' cafeteria kitchen. Waste contains the vegetables, peel of potatoes and peel of onion waste. This waste is crushed by knife and cow dung was prepared mixing with water. It is collected as slurry form as shown in figure below.



Figure 1. Source of kitchen waste



Lab Scale

In lab scale this experiment was done in 1lit for gas collector, 20 lit for digester. Here different concentration & combination of wastes are used. Different total solid kitchen waste, cow dung will be measured by mass balance and water is measured by liter. After that in 1 lit.plastic container study done to check the gas production. Then the kitchen waste of large and medium was prepared by grinding them into smaller size at the proper concentration. Initially, the cow dung mixed kitchen waste and water is mixed in mixer and they are mixed together.

Amount kitchen waste and cow dong used in our Experimental Setup of gas production

S.No	Substrate	amount
1	Kitchen waste	8 kg
2	Cow dung	2 kg
3	water	12 lit

Table 1 amount of kitchen waste taken for setup gas production

MATERIALS REQUIRED

- Empty water can 20 L capacity-1(Digester)
- Knife
- Gas collecting tube (plastic of 1L)
- Mixture
- Surge
- Caliper
- weight balance

DESIGN PROCEDURE

Kitchen waste from the kitchen was brought on 5th June, 2018. The waste was brought in a plastic container. The kitchen waste was physically assessed and was found to consist of the following mixture, vegetables like potatoes peels, onions peels. The kitchen waste has been collected from kitchen which is solid so than it can be grind by using knife and to make suitable solution by cow dung in water for making digestion fast, treated using the batch anaerobic digestion. Initially, the cow dung mixed kitchen waste water is feed to the digester.

In the batch process the feeds are sending as in liquid form. The kitchen waste is diluted with the water and cow dung are added to mixer tank and diluted. The anaerobic digester is charged and the process will be stabilized at normal temperature. The anaerobes are naturally colloidal substance because of the



formation of the gas bubbles within the liquid presented in the digester. Anaerobic digestion is carried out in an oxygen free environment. Anaerobic fermentation involving the degrading of the waste by the action of various microbes of different size and functions, leading to the production of biogas in the absence of oxygen was achieved.

- A plastic of 20L capacity, which is used as a digester.
- A syringe pipe of 1m length was joined with one of the hole made on the top of the digester, which acts to transport gas to gas collecting tube.
- A level pipe was attached on the top of the digester containing provision, and other end is connected to gas collecting tube.

Solid kitchen Waste

The maximum amount of solid kitchen waste obtained per days by direct measurement using balance recorded as follows for only one week.

The total mass of waste kitchen in one week are =700kg

In addition to this 25% we use cow dung for make our digestion is to fast.

Cow dung in one week is 175kg

Total waste in one week=875kg

Daily in put biomass=125kg/day

SELECTION OF DIGESTER

The select biogas plant is fixed dome type of digester constructed in cylindrical shape

When selecting a design, the following operating requirements need to be considered.

- ✓ The costs of a fixed-dome biogas plant are relatively low.
- ✓ It is simple as no moving parts exist.
- ✓ There are also no rusting steel parts and hence a long life of the plant (20 years or more) can be expected.
- ✓ The plant is constructed underground, protecting it from physical damage and saving space.
- ✓ While the underground digester is protected from low temperatures at night and during cold seasons, sunshine and warm seasons take longtime to heat up the digester. No day/night fluctuations of temperature in the digester positively influence the bacteriological processes

Waste Obtained from Kitchen

Daily in put mass= 125 kg/day

Density of food waste = 11600kg/m³

Sd=total mass of kitchen waste/density of food waste

Sd=125kg/day/1160kg/m³



$$S_d = 0.1077 \text{m}^3$$

Where S_d is the daily volume flow rate.

Since the waste is wet, applying one to one dilution ratio to achieve the required solid concentration that accounts $0.107 \text{m}^3/\text{day}$ of water is added. Therefore, Volume of the daily charge (S_d) = $0.214 \text{m}^3/\text{day}$.

VOLUME OF DIGESTER (V_d)

The volume of the digester (V_d) is defined as the product of the Volume of the daily charge (S_d) and hydraulic retention time (HRT).

Volume of digester = volume of the daily charge * hydraulic retention time

$$V_d = \text{HRT} * S_d$$

$$V_d = 60 \text{days} * 0.214 \text{m}^3/\text{days}$$

$$V_d = 12.84 \text{m}^3$$

Gas production rate (G)

Gas produced from food waste per day = amount of food waste per day * its Gas production rate. The gas production rate (G) for the available kitchen waste, working with $125 \text{kg}/\text{day}$ was found to be given by Daily in put biomass * its Gas production rate

$$\text{Gas production rate from food waste} = 0.05 \text{ m}^3/\text{kg}$$

$G = \text{Daily in put biomass} * \text{its Gas production rate.}$

$$G = 125 \text{ kg} * 0.05 \text{m}^3/\text{kg} = 6.25 \text{m}^3/\text{day}$$

From energy conversion [4].

$$1 \text{m}^3 \text{ of bio gas} = 6.39 \text{kwh}$$

$$6.25 \text{m}^3 = X$$

$X = 39.93 \text{kwh}$ therefore from our wastes we can get, 39.93kwh of power is received per day.

Design and Sizing of Bio digester

Among the various types of digesters, in this section of the design of fixed dome cylindrical continuous feed (displacement) digester is selected for the reason that relatively small amounts of slurry (a mixture of kitchen waste and water) are added daily. This enables that gas and fertilizers are produced continuously and predictably. After selecting the type of digester, the retention time, which parameter in determining digester size, is chosen to maximize the percentage of production of biogas with respect to the retention time.

Dimension of the Main Parts of digester

1 Dimension of Mixing Pit

The mixing pit of digester should have a size slightly greater than the daily input and better if no corners.

Assumption: Cylindrical shape is selected based on its advantage as explained on geometrical shape of digester with retention time of 60days .the diameter(D) and height(h) of mixing pit are equal

$$V = \pi d^2 h / 4$$

Where V is the daily substrate flow of the waste after providing 10% safety factor then the volume including safety (V)

$$V = (10\% * 0.214 \text{m}^3/\text{day}) + 0.214 \text{m}^3/\text{day}.$$

$$V = 0.214 \text{m}^3/\text{day}$$

In addition, volume can be written in terms of diameter as follows

$$V = \pi h d^2 / 4 = \pi d^3 / 4, \text{ solving for diameter}$$

$$4V = d^3$$

$$d = (4 * 0.214 / 3.14)$$

$$d = 0.248 \text{m} = 248 \text{mm}$$

Therefore, the mixing height (h) = d = 248mm

3.6 CROSS-SECTION OF DIGESTER

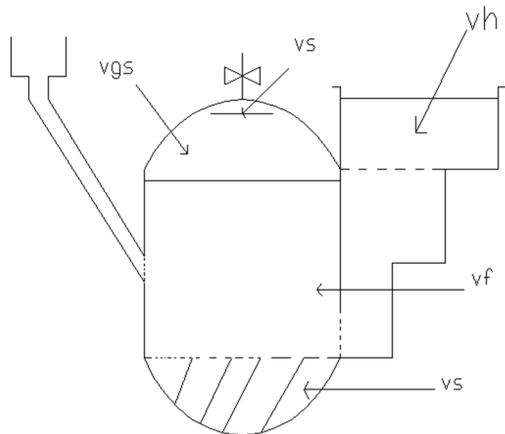


Figure 2 cross section of digester

Where

- a) Volume of gas collecting chamber = V_c
- b) Volume of gas storage chamber = V_{gs} , $V_{gs} + V_c = V_1$
- c) Volume of fermentation chamber = $V_f = V_3$
- d) Volume of hydraulic chamber = V_H
- e) Volume of sludge layer = V_s

Total volume of digester (V_T) = $V_s + V_f + V_c + V_{gs}$ GEOMETRICAL DIMENSION OF THE CYLINDRICAL SHAPED BIOGAS DIGESTER BODY



For volume	For geometrical dimension
$V_3 \leq 5\%V$	$D=1.3078 * V^{1/3} F_1=D/5$
$V_3 \leq 15\%$	$V_1=0.0822D^2, R_1=0.725D, S_1=0.911D^2$
$V_{gs}+V_f=80\%V$	$V_3=0.3142D^2$
$V_{gs}=V_H=K(V_2+V_3)(1-0.40.5k)$, here $k=0.4m^3/m^3d$, is gas production rate per m^3 digester volume per day	$V_2=0.5011D^2, R_2=1.065D, F_2=D/8, S_2=0.83445D^2$ where D is the diameter of digester

Table :2 Volume Calculation of Digester Chamber

$$V_d=0.05011D^3+0.3142D^3$$

$$V_d= (0.05011+0.3141) D^3$$

$$V_d=0.364D^3$$

$$12.84/0.364=D^3$$

$$D=3.27m=327mm$$

Parameter is calculated by substituting the value of diameter in the above geometrical relation presented in table and obtained as

$$V_1=0.0822 * D^3$$

$$0.0822 * 3.27^3 m^3 = 2.87 m^3$$

$$V_2=0.05011D^3$$

$$0.05011 * 3.27^3 m^3 = 1.75 m^3$$

$$V_3=0.3142D^3$$

$$0.3142 * 3.27 m^3 = 10 m^3$$

$$V_T=V_1+V_2+V_3$$

$$V_T= 2.87 m^3 + 1.75 m^3 + 10 m^3 = 14.62 m^3$$

$$F_1=D/5$$

$$3.27/5=0.654m$$

$$F_2=D/8$$

$$3.27/8=0.408m$$

$$S_1=0.911D^2$$

$$0.911(3.27)^2 = 9.74 m^2$$

$$S_2=0.8344D^2$$

$$0.8344(3.27)^2 = 8.922 m^2$$

$$R_1=0.725D$$

$$0.725 * 3.27 = 2.37m$$

$$R_2=1.065D=1.065 * 3.27 = 3.48m$$

Now the dimension of digester chamber is known & drawn below. From Experiment we have done measure the kitchen waste and fresh cow dung to know amount of slurry used in our model of digester. Experiment set up is used to produce the biogas from kitchen waste of 8kg and 2kg of cow dung and also 12 liter of water is used in the mix to make good slurry for the digestion. The study evaluates biogas production from kitchen waste (peel of onion and potatoes) waste through an anaerobic digestion of 20L capacity designed and built in the lab. In the duration of 10 days, biogas production started from the 3th day. The total amount of gas production recorded up to 10 days. kitchen waste and cow dung getting converted into biogas which collected in gas collector. for the first two days there is no gas production. the gas production is start after three day. The gas produce for one week was 18.5ml. so the use of mixing cow dung and kitchen waste provide more efficient method of biogas generation.

Table below describes amount of gas produced in the one week which measured by displacement method.

RESULT AND DISCUSION

Day	Amount of gas produced
1	0
2	0
3	0.5ml
4	1ml
5	1.5ml
6	2ml
7	2.5ml
8	3ml
9	3.5ml
10	4.5ml

Table 3 Total biogas obtain in one week from experiment set up



Fig.3 Small scale of experiment

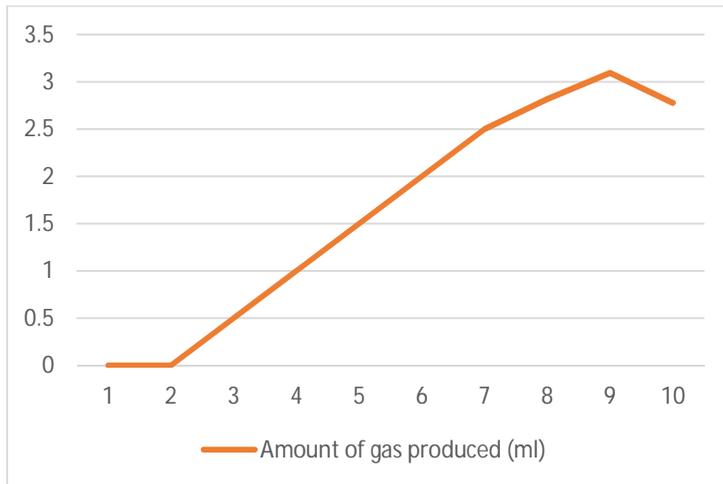


Fig. 4 Time (days) Vs Amount of gas (ml) produced

As it is shown in above experimental data the starts being production from day 3 and increases upto the first nine(9) days and then the gas production amount reduced after 9 days.

Conclusion

The research was conducted on biogas system design and its feasibility for kitchen. In this study it was observed that the proper working of biogas digester can be achieved if the operating & process parameters are kept at optimum condition for the designed 12.85m³ biogas digester. It is necessary to feed with 0.107m³/ day for 60 days of retention time to avoid pathogenic effect on. Based on the findings of this study, the following conclusion can be drawn:

- The biogas digester is simple but effective option to save cost on power.
- It was established that there was enough waste (125kg per day) for production of sufficient biogas of about 0.107 m³ per day to substitute the use of wood fuel and liquid petroleum gas.
- Total gas produced is 6.25m³ / day. This gas produced using energy conversion gives us 39.93 kwh of power per day.
- Any excess gas generated should be used for light and cooking.

Organic fertilizers can be made from the slurry generated after the biogas production process. This can also be sold to generate income for me.

Organic fertilizers can be made from the slurry generated after the biogas production process. It has been found that installation of biogas plant leads to larger savings besides environmental and sanitation benefits. This implies



successful installation of this plant and similar others will prove to be economical in the face of rising number of students and fire wood scarcity and prices. This contributes a lot in environmental protection and sanitation efficiency. If similar projects are installed in all universities, its impact on the forest protection will be well vivid. The bio fertilizer thus produced can be used for plantations and gardens found in the faculty. This has dual benefit in the waste management and bio-fertilizer utilization. It can further open a window of opportunity in introducing bio-fertilizer for the local famers around Mettu University Installation of the plant is highly recommended due to its financial and environmental benefit.

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DESIGN OF SOLAR POWERED INJERA BAKING OVEN SYSTEM FOR HOUSEHOLDS AT METTU AREAS

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Abstract

From pre- history of human civilization to this time, most of the people around the world particularly the third world country, depend on wood or biomass fuel as source of energy for cooking their meal. Using wood as source of fuel for cooking will result in health problem and environmental pollution.

‘Injera’ is the stable bread in Ethiopia; it is perhaps consumed by almost all Ethiopian people on a daily basis. Biomass fuel can consist of either wood, crop residues, or dried animal dung and using these energy sources can result in negative effects such as deforestation, environmental pollution and health problem. Women and children are the main groups exposed to the indoor smoke produced while cooking.

So to reduce and to avoid the addressed problem that are caused due to burning of biomass fuel and to provide environmental protection, it is important to address need for a new fuel source by utilizing energy from the sun by using of solar powered injera baking machine. Solar powered injera baking machine consists of the parabolic trough solar collector (PTSC), oil storage tank, the piping system, the baking pan assembly, supporting frame and legs as its main components is designed which is the aim of the project.

The solar powered injera baking system uses solar radiation as the source of energy. It uses parabolic trough solar collector to convert the solar radiation in to heat energy. The heat energy is conveyed from the source (collector) to the end use compartment (baking pan surface) using heat transfer oil (shell thermia B) through pipe lines and re-circulates in the system by density difference since it is passive system.

Key words: ‘Injera’, Solar power, parabolic trough solar collector, ‘Mitad’

Introduction

Food is a universal need, which uses energy for its preparation. Gathering, preparing, and consuming food is subject to many cultural considerations. It is known that, the energy requirements in developing countries are largely met from forests and agricultural waste, and the options for cooking food is limited, most of the time they rely on wood as a

primary fuel and cooking on simple open fires. [15] Technical advances in energy efficiencies are critical for developing countries like Ethiopia, whose populations depend primarily on biomass fuels such as wood, charcoal and agricultural residues. Overuses of these fuels deplete resources; degrade local environments, spent time needed to collect fuel, and creates indoor air pollution that cause health problems.

The sun is an inexhaustible source of energy; the amount of solar energy an area receives depends on the time of day, the season of the year, the cloudiness of the sky, and how close the area is to the earth's equator. Ethiopia is close enough to the equator to get plenty of solar power; in a fourth rank in the world in terms of solar cooking potential, with thirteen months of sunshine [16] [25] So it is important to use the technology of using solar energy for injera baking system such as solar powered injera baking machine in order to solve the addressed problems and to have sustainable environment.

Materials and Method

Item of PTSC	Value
Focal length	0.72m
Aperture width	2.5m
Aperture area	10m ²
Rim angle	82°
Receiver diameter	47mm
Concentration ratio	17.04
Height /depth	0.56m
Surface area	11.5m ²
Inner diameter of receiver	47mm

Table 1 specification of parabolic trough



Fig.2 Parabolic trough solar collector

Geometrical Design of Parabolic Trough Solar Collector

Parabolic Trough Solar Collector (PTSC) which is also called cylindrical parabolic collector employs linear imaging concentration. These collectors are comprised of a cylindrical concentrator of parabolic cross-sectional shape, and a circular cylindrical receiver and evacuated glass located along the focal line of the parabola. A half-section of a PTSC is shown in figure below.

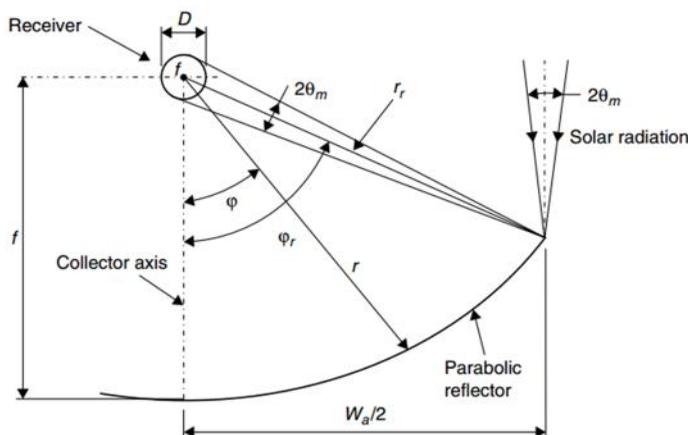


Fig. 1 A half-section of a PTSC

Basically PTSC consists of

- i. A parabolic reflector aperture width,
- ii. An absorber (receiver) tube made of steel or copper that is coated with selective coating, and
- iii. A concentric tubular glass covers surrounding receiver with a gap of about 1-2 cm which

Note that the annual solar rim angle of the Mettu area is 82° relative to optical axis and the focal point of a parabolic trough. It is intended to fix only aperture width of the collector to 2.5m and calculate all necessary dimensions of parabolic trough solar collector as below. The rim angle (φ_r) corresponds to beam radiation reflected from the outer rim of the concentrator. The focal length, f is related to rim angle, and aperture width, W_a and calculated as below:

$$W_a = \frac{4f \sin(\varphi_r)}{1 + \cos(\varphi_r)} = 4f \tan\left(\frac{\varphi_r}{2}\right)$$

$$f = \frac{W_a}{4 \tan\left(\frac{\varphi_r}{2}\right)} = \frac{2.5\text{m}}{4 \tan\left(\frac{82^\circ}{2}\right)} = 0.72\text{m}$$

The radius of parabola at an arbitrary location is defined by r , and is called the "mirror radius". As φ varies from 0 to φ_r , increases from r to r_r . The maximum mirror radius occurs at its outer rim and is fittingly called "rim radius" (r_r) or parabolic radius and it's given by:-

$$r_r = \frac{2f}{1 + \cos(\varphi_r)}$$

$$r_r = \frac{2 \times 0.72}{1 + \cos(82^\circ)} = 1.26\text{m}$$

The size of a reflected solar image at the focal point depends upon the mirror radius at the point of incident of the beam radiation. A simple equation for the image width W_{im} is given by:

$$W_{im} = r\theta_s$$

Where θ_s represents the angular width of the incident beam radiation of 0.53 (≈ 0.00925 rad), acceptance half – angle θ_m of 0.267° , and the reflected beam path length is equal to the parabolic radius, r and the maximum solar image width can be:

$$W_{im_{max}} = r_r \times \theta_s = 0.00925 r_r = 1.26m \times 0.00925 = 11.65mm$$

(a) **Concentration ratio (C)**

The concentration ratio is one of the central parameters of the collector. It is decisive for the possible operating temperatures of the parabolic trough. Concentration ratio is defined as the ratio of the collector aperture area to the receiver aperture area. For a tubular receiver, the concentration ratio is given by

$$C = \frac{W_a \times l}{\pi D_1 \times l}$$

By replacing D_1 and W_a

$$C = \frac{\sin \phi_r}{\pi \sin 2\theta_m}$$

The maximum concentration ratio occurs when ϕ_r is 90° and $\sin 90^\circ = 1$. For our design case the concentration ratio, C using equation 4.4 above will be:

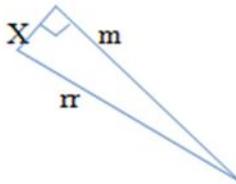
$$C = \frac{\sin(82)}{\pi \sin(2 \times 0.53)} = 17.04$$

From equation (4.4) inner diameter of receiver, D_1 can be calculated as:

$$D_1 = 2r_r \sin 2\theta_m = \frac{W_a}{C\pi} = \frac{2.5m}{\pi \times 17.04} = 47mm$$

From equation (4.4) for concentration ratio, $C = 17.04$ and the length of parabola can be 4m. Geometric relationship the height or depth of parabola can be calculated.

Using Pythagoras formula of triangle:



$$X = \sqrt{1.26^2 - 1.25^2} = 0.16m \text{ And the height or depth of parabola, } H_p \text{ can be}$$

$$H_p = f - X \rightarrow 0.72m - 0.16m = 0.56m$$

For different rim angles, the focus-to-aperture ratio, which defines the curvature of the parabola, changes. It can be demonstrated that, with a 90° rim angle, the mean focus-to-reflector distance and hence the reflected beam spread is minimized, the curve length of the reflective surface of parabola (S) is given by

$$S = \frac{H_p}{2} \left\{ \sec \frac{\phi_r}{2} \tan \frac{\phi_r}{2} + \ln \left[\sec \frac{\phi_r}{2} \tan \frac{\phi_r}{2} \right] \right\}$$

$$s = \frac{0.56}{2} \left\{ \sec \left(\frac{82}{2} \right) \tan \left(\frac{82}{2} \right) + \ln \left[\sec \left(\frac{82}{2} \right) \tan \left(\frac{82}{2} \right) \right] \right\} = 0.362m$$

$A_{ap} = W_a \cdot l$ By substituting the values of width and length of collector ($W_a = 2.5m, l = 4m$) aperture area will be:

$$A_{ap} = 2.5 \times 4 = 10m^2$$



The surface area of a parabolic trough may be important to determine the material need for the trough. The area is calculated as follows:

$$A_S = \left(\frac{W_a}{2} \sqrt{1 + \frac{W_a^2}{16(f)^2}} + 2f \cdot \ln \left(\frac{W_a}{4f} + \sqrt{1 + \frac{W_a^2}{16(f)^2}} \right) \right) \cdot l$$

By substituting all values; surface area of a parabolic trough (A_S)

$$A_S = \left(\frac{2.5}{2} \sqrt{1 + \frac{2.5^2}{16(0.72)^2}} + 2 \times 0.72 \ln \left(\frac{2.5}{4 \times 0.72} + \sqrt{1 + \frac{2.5^2}{16 \times (0.72)^2}} \right) \right) \cdot 4$$

$$= [1.655 + 1.13] \times 4 \text{m}^2 = 11.5 \text{m}^2$$

The very important specification of parabolic trough going to be designed is depends on apparent power that the trough generates. PTSC can generate a temperature up to 400°C and for our case; it generates about 272.5°C from solar radiation. The Stefan–Boltzmann law describes that the power radiated from a body in terms of its temperatures; specifically, total energy radiated per unit surface area of a body across wavelengths per unit time, is directly proportional to the fourth power of the body's thermodynamic temperature T and mathematically given by:

$$\frac{P}{A} = \epsilon \sigma T^4$$

Where

- ϵ – Emissivity of (mirror material=0.96) a body
- σ – Boltzmann constant= $5.67 \times 10^{-8} \text{J/s.m}^2. \text{ } ^\circ\text{C}^4$
- P–power radiated by
- A–area of a body (PTSC =10m²)
- T–temperature of a body = 272.5°C

Substituting all values into equation (4.9), apparent power generated by PTSC on receiver tube is:

$P = 10 \times 0.96 \times 5.67 \times 10^{-8} \times [272.5]^4 \text{J/s} = 3 \text{kW}$ The total or apparent power generated by parabolic trough collector including the loss across the pipe line, storage and baking pan assembly is **3Kw (272.5°C)** and this is base for design of the whole system. Overall design specification of the PTSC is tabulated as below from above calculated values and other parameters depend on these dimensions

Design of the Baking Pan Assembly

Baking pan assembly consists of components such as pan cover, baking pan/mittad, heat transfer fluid gallery, and pan assembly supporting frame.

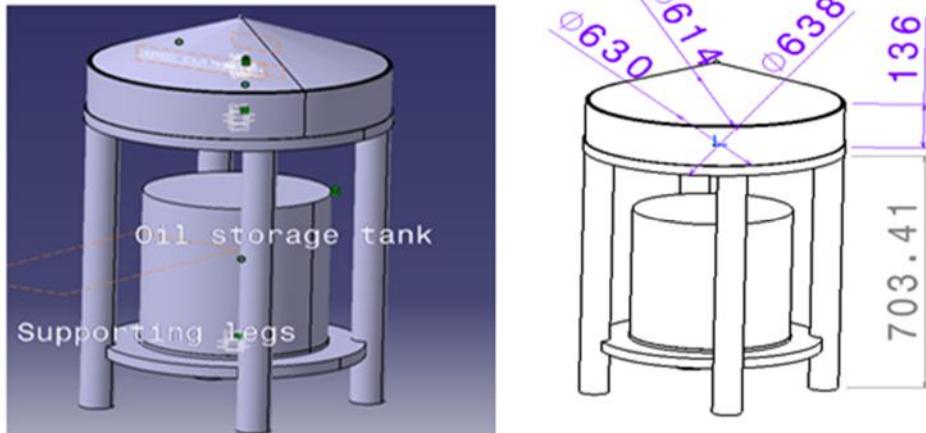


Fig.3 Baking pan assembly

Baking Pan: Ceramic baking pan/mittad is selected to bake injera because it offers several advantages over other types of cookware.

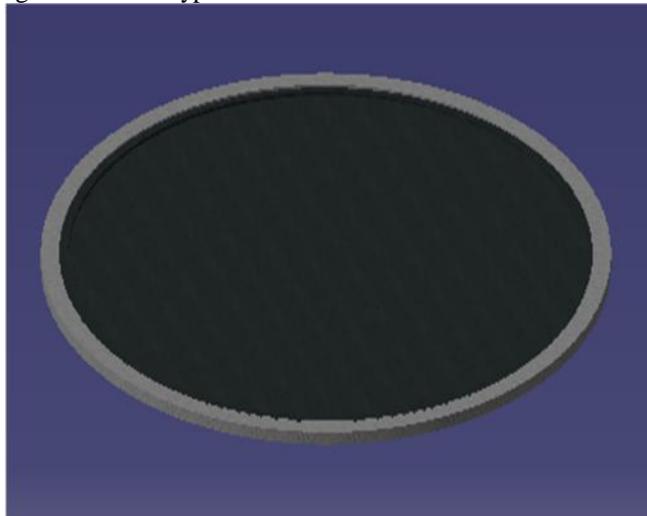


Fig 4. Baking pan

Design of Baking Pan Cover: A baking pan (ceramic baking pan $K= 0.8W/m.K$, $C_p = 960J/kg.K$, $\rho = 2400kg/m^3$) is a flat and circular pan commonly about 50 to 60cm in diameter and traditionally used over large clay hearths to bake injera [20]. The baking pan 'mittad' considered in this case was 3mm thick and 580mm in diameter and because of its reduced thickness, it has high thermal conductivity than the one which is available

in the local market. Direct contact of the pan with the hot heat transfer oil can cause cracking of the baking pan; therefore, the baking pan was separated from the heat transfer fluid with a conductive copper sheet metal.

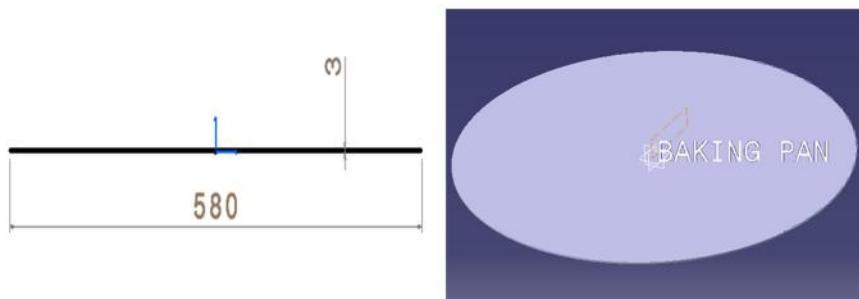


Fig 5. Baking pan cover

Design of Heat Transfer Fluid Gallery

To transfer heat energy uniformly from the heat transfer oil; the oil storage below the pan was used to overcome sudden drop of surface temperature during baking below the optimum baking temperature. The oil inlet and outlet ports were drilled with 1.27cm diameter size on opposite sides of the housing of the gallery; pipes with 1.27 cm diameter were welded to the drilled inlet and outlet ports. To increase the contact between the hot heat transfer oil with the pan supporting plate, fin like structures were welded inside the oil gallery to hinder direct oil flow and also to increase strength of the gallery. In order to decrease heat loss, the oil gallery was insulated by ash insulation system which has about 3.5cm thickness from below and the side wall. The volume of the oil gallery (V_g) can be determined as follows:

$$V_g = \frac{\pi}{4} D_g^2 h_g \quad \text{which gives } V_g = \frac{\pi}{4} 0.58^2 \times 0.04 = 0.01056\text{m}^3 = 10.56 \text{ liters}$$

But these are fin structure inside the oil gallery and its volume is: $V_{fm} = lwh = 2[(0.53 \times 0.003 \times 0.04) - (0.04 \times 0.04 \times 0.003)] = 0.000118\text{m}^3$

Hence the effective volume (V_{eff}) of the oil gallery is :

$$V_{eff} = (0.01056\text{m}^3 - 0.000118\text{m}^3) = 0.01044\text{m}^3 = 10.44 \text{ liters}$$

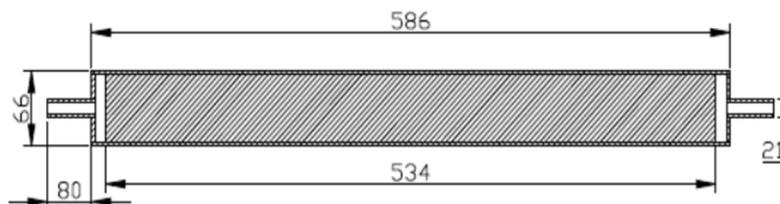


Fig 6. heat transfer fluid gallery

Design of pan assembly support frame

Pan assembly support frame is provided to support the weight of baking pan assembly and used to comfort for anyone who is working with it. Supporting frame materials should be strong, durable, heat resistive to provide long life service. The height of this supporting frame must be designed to all medium age humans. The total height of the supporting frame including pan assembly must not exceed 1meter, thus it is easy to control and work with it. This supporting frame consists of four legs to support load, and angle iron of 8mm thickness is selected.

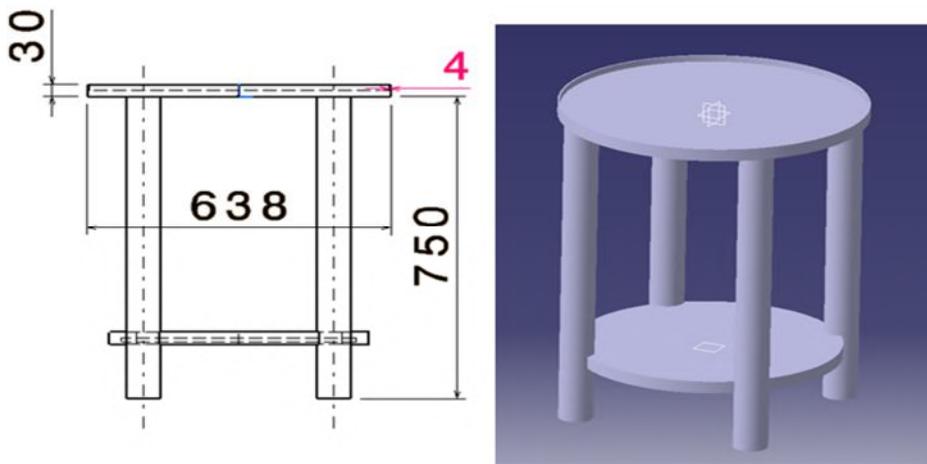


Fig 7. Pan Support frame/legs

Design of the oil storage tank

An expansion tank is necessary to allow for the change in fluid volume upon heating. The volume of mineral oil (Thermia oil B) at 300°C is about 20 per cent greater than at room temperature. In this particular case instead of expansion tank the volume of the tank was designed by considering the amount expected to expand at the optimum temperature, so that the tank was large enough to accept the total heat expansion within its own dimensions.

Substituting values and the final density (ρ_f) will be:

$$\rho_f = \frac{863}{[1+0.008(320-20)]} = 695.968\text{kg/m}^3$$

Considering the volume expansion of the oil, assume that volume of the heat transfer fluid in the storage tank is 30 liters.

$$V_f = \frac{m}{\rho_f} = \frac{V_o \times \rho_o}{\rho_f} = \frac{0.03 \times 863}{695.986} = 37.2 \text{ liters}$$

The volume of mineral oil (Thermia oil B) at 320°C is about 20 percent greater than at room temperature, therefore volume of oil including its expansion is the volume of oil storage tank and given by:

$$V_{st} = V_f + 20\% \times V_f = 37.2 + 0.2 \times 37.2 = 44.6 \text{ liters}$$

Relative to volume of storage tank, the dimension of storage tank can be estimated by fixing height ($h = 400\text{mm}$) and radius of storage (r) can be calculated.

$$V_{st} = \pi r^2 h \text{ which gives } V_{st} = \pi r^2 0.4 = 0.0446\text{m}^3 \rightarrow r = 188.5\text{mm}$$

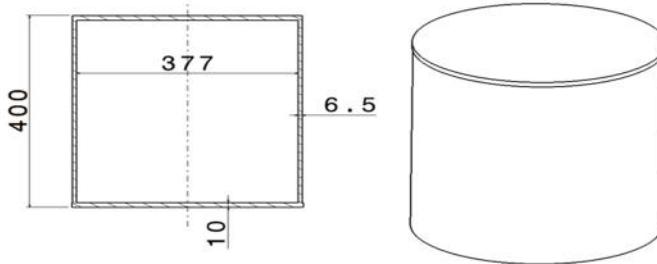


Fig. 8 Oil storage tank

Applying the above assumptions, the utilized energy can be obtained from the following equation

$$E_{utilized} = m_{batter} C_p (T_{boil} - T_{room}) + (m_{batter} - m_{injera}) h_{vapor}$$

Where:

m_{batter} – Is the mass of the batter expected for one injera= 400g

T_{boil} – Is the boiling temperature of water = 95°C

T_{room} – Is the room temperature in the baking pan=25°C

C_p –Is the heat capacity of water = 4.187kJ/kg.K

m_{injera} –Is the mass of the injera produced = 320g

$m_{loss} = m_{batter} - m_{injera}$

h_{vapor} – Is the heat of vaporization of water $h_{ig@95^\circ\text{C}} = 2260\text{kJ/kg}$

$$E_{utilized} = 0.4 \text{ kg} \times 4.187 \text{ kJ/Kg} \cdot \text{K} (95 - 25) \text{ K} + (0.4 - 0.32) \text{ kg} \times 2260 = 133.984 \text{ kJ} + 180.8 \text{ kJ}$$

$$E_{utilized} = 298.036 \text{ kJ}$$

During injera baking there are losses in pipes, in storage tank, and in the oil gallery, so considering the losses and assuming total amount of losses to be 20% of our energy utilized. Hence, total energy required will be $298.036 \times 20\% + 298.036 = 357.6432 \text{ kJ}$. The time taken for cooking of one injera is assumed to be about 2 to 3 minutes, taking 3 minutes; the power required (P) for injera baking can be calculated as:

$$P_{utilized} = \frac{E_{utilized}}{\Delta t}$$

$$\Delta t = 3 \times 60 = 180 \text{ seconds} \quad \text{Then: } P = \frac{357.6432 \text{ kJ}}{180 \text{ s}} = 1.987 \text{ Kw}$$

From the design specification calculated value in chapter four, the total or apparent power generated by parabolic trough solar collector including loss is **3kW**. The efficiency of baking system relative to its input and output can be calculated as:

$$\eta_{system} = \frac{\text{power utilized}}{\text{power generated}} \times 100 = \frac{1.987 \text{ kW}}{3 \text{ kW}} \times 100 = 66.23\%$$

From this apparent power it is possible to calculate the mass flow (\dot{m}) rate of heat transfer fluid as follows:

$$\dot{Q} = \dot{m} C [T_{pan \text{ surface}} - T_{\infty}] \quad (5.8)$$

Where

- \dot{Q} – Apparent power (3kW) design specification
- C – Specific heat capacity of Shell Thermia oil B at pan surface temperature of 200°C which is 2.538kJ/kg°C
- $T_{\text{pan surface}}$ – Baking pan surface temperature = 200°C
- T_{∞} – Ambient temperature of the environment =25°C

Substituting all values, the mass flow rate of oil can be:

$$\dot{m} = \frac{\dot{Q}}{C[T_{\text{pan surface}}-T_{\infty}]} = \frac{3\text{kW}}{2.538\text{kJ/kg}^{\circ}\text{C}[200-25]^{\circ}\text{C}} = 0.0066 \text{ kg/s}$$

Fig 9 Assembly of solar powered injera baking machine/oven

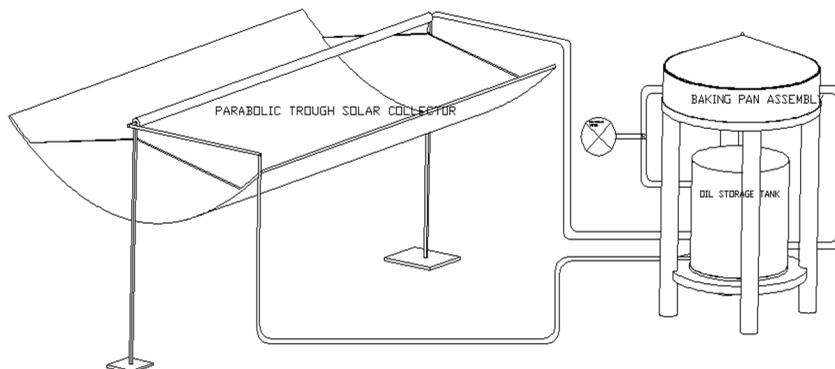
CFD ANALYSIS OF RECEIVER OF PTSC

CFD techniques are used to study the behavior of receiver of PTC. This is done at temperature of 272.5°C, the mass flow rate of oil is at 0.0066kg/s and the property of Shell Thermia Oil B are:

Thermal conductivity of oil ; $k = 0.124\text{W/mk}$

Density of oil ; $\rho = 774\text{kg/m}^3$

Kinematics viscosity; $\nu = 2.85 \times 10^{-6} \text{ m}^2/\text{s}$



Specific heat capacity ; $c = 2.40\text{kJ/kg.k}$

Assumption for the analysis:

- Steady state conductions.
- Negligible contact resistance between the supporting plate and pan.
- One dimensional heat flow through the x –direction.
- The pan surface temperature is assumed to be 200°C (the average).
- The effect of conductive heat transfer of fin like structure is assumed in significant.

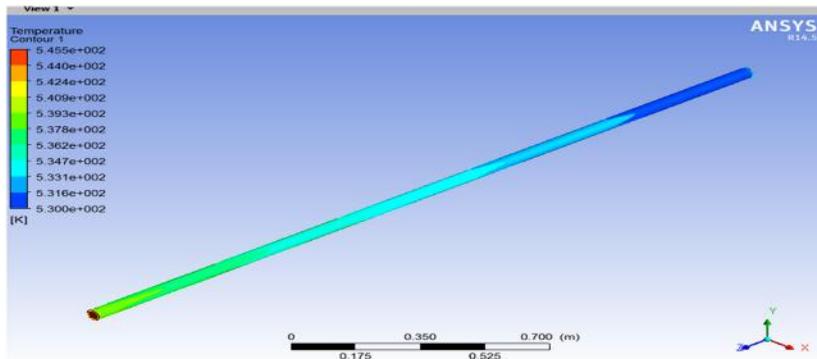


Fig.10 Contour of temperature from inlet to outlet

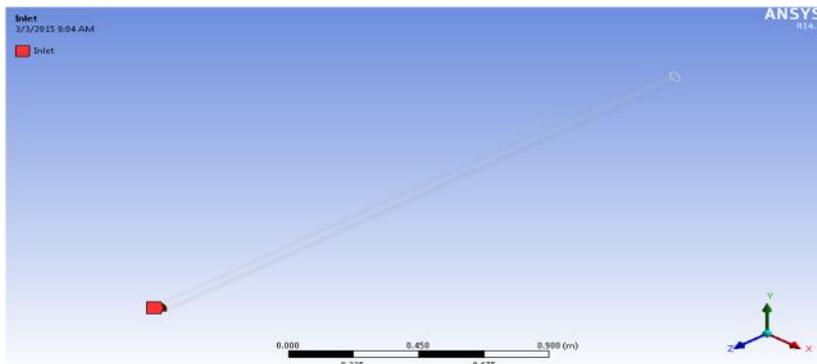


Fig.11 Inlet of the receiver

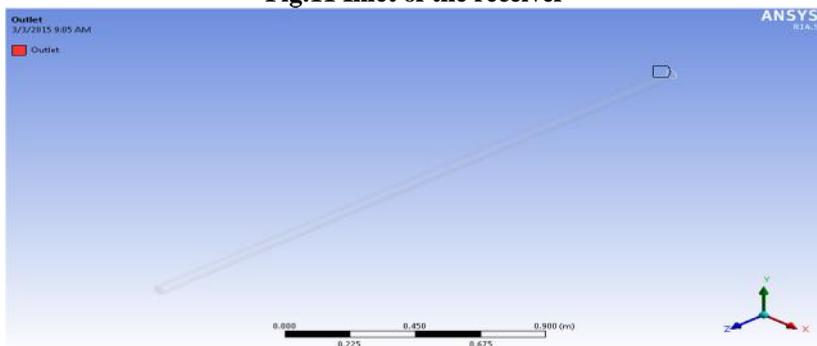


Fig.12 Outlet of receiver

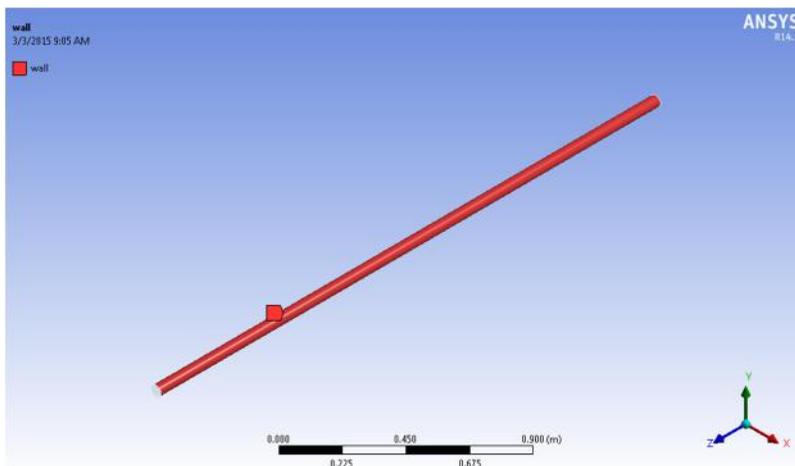


Fig. 13 wall of receiver

From CFD analysis result the temperature of receiver of PTSC is at inlet 545.5k (272.5°c) and at outlet 530k (257°c). Decreasing of the temperatures from inlet to outlet is that, there is heat loss between them.

Conclusion

The utilization of solar energy for baking injera would reduce the dependence on fossil fuels and their adverse environmental effects. In Ethiopia using renewable energy source like solar energy for injera baking is the best solution since sunlight is usually abundant and free.

Reducing heat loss by using insulation is often a cost effective energy saving mechanism. However, the effect of adding insulation and understanding insulation economics is important since the addition of insulation produce cost-effective benefits, while there is a point of diminishing returns of savings for increasing the levels of insulation. In this particular case mineral wool insulation system is used for oil storage tank, pipes and the oil gallery because of its less costly and good insulation material (low thermal conductivity).

The Thermia B shell heat transfer oil was used as heat transfer fluid; because of its high operating temperature, high initial boiling point, low vapor pressure, non-corrosive, nontoxic, high heat transfer coefficient, and thermally stable. In addition to this, it has the ability to capture (absorb) the temperature it has for a long time (estimated 3 to 4 hours) after the power source is off; which is very helpful in case solar radiation is not available (or sudden cloudy condition is happened).



From CFD analysis result the temperature of receiver of PTSC is at inlet 545.5k (272.5°c) and at outlet 530k (257°c). Decreasing of the temperatures from inlet to outlet is that, there is heat loss between them. Also, total efficiency of this solar powered injera baking oven gives us 66.23%.

Recommendation and Future Work

To improve solar powered Injera baking by using parabolic trough [solar collector], the Injera baking system needs time for the pan surface to recover its temperature after each Injera baking cycle so that, it is better to recommend that baking pan should be a high thermal conductivity material like copper.

To generate more energy, temperature and reduce baking time series of PTSC and higher oil temperature circulation should be used. When we design solar powered Injera baking from solar energy we have to use free sun light to get the most efficient power for storing and heating of oil fluid

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PERCEPTION OF STUDENTS TOWARDS JOINING DELL IN SOME SELECTED ETHIOPIAN UNIVERSITIES: THE CASE OF METTU, GAMBELA, WOLLEGA AND JIMMA UNIVERSITIES

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Abstract

The main objective of this study was to explore perception of students towards joining Department of English Language and Literature (DELL) in some selected Ethiopian universities (the case of Mettu, Gambela, Wollega and Jimma universities). In order to achieve the intended objectives of the study, mixed method approach which incorporates qualitative and quantitative methods to answer the research questions were used. The participants from the four universities were all students who joined DELL and some selected students from other social sciences on random sampling techniques plus their instructors, department heads and faculty representatives. Accordingly, 360 students majoring in DELL, 400 students from other social science, 77 DELL instructors, four DELL department heads and four faculty (college) representatives were the participants. Questionnaires, interview, observation and document analysis were data gathering tools in the current study.

The data from questionnaires were analyzed in such a way that frequencies were counted. The extents of frequency of responses were set in percentage form in tables for which more descriptions and explanations were given. In addition, responses from other tools were orchestrated and triangulated qualitatively and quantitatively. Thus, data analyses and discussions were made integratively. The findings of this study indicated that students coming from high/ preparatory schools had negative perceptions toward English subject that they did not want to join DELL. As the finding showed students feel discomfort, timid, shy or afraid of exercising, or practicing it. Hence, they find it difficult to be proficient in it. Moreover, the study showed students did not get exposures or were not given sufficient opportunities to work at their lower levels. Thus, when they arrived higher institutions their English class room anxiety would become higher and learning would not come positive.

Lastly, this resulted in a negative perception of the students towards the department of English. It was the finding of this study that students made no effort or if any, very little in doing learning/ studying. They more often studied/ learnt just to pass in their exams. No extensive effort was carried out by the students even when tasks were given. Accordingly, it was recommended that proficiency in English language happens only if students used, exercised, or practiced the language; teachers at lower levels should create those opportunities for their students. And, students English class room anxiety was observed high at higher institution. This could be avoided if students were exposed to different opportunities to use the language. The negative perceptions of students toward joining DELL rooted to the students zero commitment at their grassroots levels. Therefore, students should make any effort possible, including extensive activities, let alone, the teacher guided exercise. Moreover, students' negative feelings were other contributors of negative perceptions, so these hindrances should be avoided by students self-conscious about their feelings. Finally, extreme worry to the mistakes could be corrected.

Key words: DELL, perception, anxiety, exposure, self-conscious,



INTRODUCTION

It is argued that language learning is regarded as the cornerstone of human existence. Knowing the language can help us to express our opinions, hopes, and even our dreams. In foreign Language learning context, there are various factors that influence the learning process such as motivation, perception, anxiety, learning achievements, aptitudes, intelligence, age, personalities, etc. (Gardner, 1960; Lehmann, 2006, cited in Shams,2008). The matter of learner's perception is acknowledged as one of the most important factors that impact on learning a given language. This study looks into the concept of perception as one of the major affective factors for success in learning English language and Literature. More specifically, it investigates Ethiopian University students' perceptions towards joining English Language and Literature Department.

Kara (2009) stated that perceptions towards learning besides opinions and beliefs have an obvious influence on students' behaviors and consequently, on their performance. It is argued that those students who possess positive beliefs about English language and literature learning have a tendency to increase more positive attitudes towards English language and literature learning. Conversely, negative beliefs may lead to class anxiety, low cognitive achievement, and negative attitudes (Victoria &Lockhart, 1995). The purpose of education in Ethiopian Universities is to obtain high grades and passing the exams to pursue life. Creativity and understanding the nature of students and their needs are not taken into account. The EFL teachers' role is basically to transmit information to their students effectively. There exists little knowledge about the best strategies to develop the students not just cognitively but also behaviorally and emotionally. The concern on the learners' perception towards the target language plays a key role in enhancing and motivating them to learn that language. This, in turn, affects their performance, too.

It is said that language teachers, researchers, and students should acknowledge that high motivation and positive attitude of students facilitate second language learning. Thus, if a learner does not have the interest and tendency in acquiring the target language to communicate with others, this learner will possess a negative attitude and will not be motivated and enthusiastic in language learning. Therefore, learners' attitudes could incorporate in language learning because it may influence their performance in acquiring the target language. Students' attitude, i.e. feelings, beliefs, likes, dislikes, needs, should be considered, since their attitudes influence language learning. This study looked into the concept of attitude as one of the major affective factors for success in learning a foreign language. More specifically, it investigated DELL (Department of English Language and Literature)students' perceptions' of some Ethiopian University toward learning English language and literature.

Statement of the Problem

In this fast-shrinking world, English seems to be one of the major players of the global village. Today English is used as an international language in diplomacy, international trade, tourism, international media, air-traffic control, pop music industry, technology, and etc. There are 1.5 billion English users around the world. While 337 million of the mare native speakers of English, 1.2 billion of them are non-native speakers with reasonable competence (Crystal, 1997). However, English is considered as an international language not only because nearly a quarter of the world's population is already fluent or competent in English, but also English has a special status in almost every country in the world. According to Crystal (1997) English has an official status in more than 70 countries, and is taught as a primary foreign language in more than 100 countries.

English is defined as an international language which is used by native speakers and non-native speakers of it to communicate both within the nation and among nations, and scholars approach the notion of English as an International Language (EIL) from various perspectives_ from critical perspective, from cross-cultural perspective, from historical perspective.



Pennycook(1994, 2001) questions and discredits the assumptions that the spread of English is a natural and neutral process, and that the use of English for intercultural communications will be beneficial. He states that the discourse of English as an International Language (EIL) has moved from rhetoric of colonial expansion, through a rhetoric of development aid to a rhetoric of the international free market and therefore English carries the colonial past that teachers and language users need to be aware of. Furthermore, Phillipson (1992) argues that English language replaces local languages and cultures. Although English is not replacing any Ethiopian languages, there are borrowed English words used in our native languages usages came after technological output.

English language has an undeniable role in our country. It is considered the most significant and functional language for the technological and scientific developments applied in our country context. It is a compulsory school subject that students start learning it from lower grade and continue to study even after they graduate from the university. English language proficiency seems to be a prerequisite to be able to take a position in competitive job market; in major newspapers, in the job advertisements and so on.

Irrespective of all these demands of English Language, our university students are seen moving away from specializing in this study; even, with possible specializations in the social science fields they don't like to join English language and literature department. The one who joined it, are not of their interest to specialize in it. Since, English plays an important role in our country, our students are expected to master English language and use it in their personal and professional lives; and there is a need to obtain an in-depth look to describe their perceptions and attitude holistically. Therefore, this study was expected to explore English language learners' perceptions' towards joining English language and literature department.

Research Questions

In this study, the researchers attempted to answer the following basic research questions.

1. How are students assigned to English language and literature departments?
2. Do significant relation exist between interest based departmental selection and the achievement afterwards?
3. What is the impact of own choice on achievement compared to the pushed once to join without interest?
4. What are students' perceptions toward joining DELL, then?

Objectives of the Study

The main objective of this study was to assess the perceptions of students toward DELL in some selected Ethiopian universities.

Specifically, this study intended to:

1. Assess how students are assigned to English language and literature departments.
2. Examine significant relations between interest-based departmental selection and the achievement afterwards.
3. Examine the impact of own choice on achievement compared to the pushed once to join without interest. And,
4. Explore the students' perceptions toward DELL.

Significance of the Study

This study may highlight the need for self-awareness by instructors, deans and faculty representatives to look in to the matters of specialization techniques that may impact students' outcomes. In addition, since the result may indicate students' perceptions towards DELL, Ethiopian universities will take proactive measures for their students' perception towards the department



English. Finally, this study may open a way for further investigation for those who might be interested in this area.

Scope of the Study

As stated earlier, the current study focused on assessing the perceptions of students towards DELL in some selected Ethiopian universities. In order to manage the study very carefully, its delimited to Mettu, Wellega, Gambella and Jimma universities students and their instructors, deans and faculty (college) representatives. The researchers' target group was students and their instructors. The reason why this study was delimited only to students and their instructors is that the primary relevance of the study is to cope up with students perceptions towards specializing in DELL. It is felt that demonstrating all specializations in all universities cannot be carried out within limited period of time that the study was delimited to raise only the perceptions of students towards DELL in some selected Ethiopian universities and recommending some possible indications of the findings.

RESEARCH DESIGN AND METHODOLOGY

Research Design

The purpose of this study was, first, to assess the perceptions of students toward DELL in some selected Ethiopian universities. And the second was, to examine the impact of interest based departmental choice on the learners achievement/ score compared to the without interest. In order to achieve the intended objectives of the study, mixed method approach which incorporates qualitative and quantitative methods to answer the research question was used. This research design was used because social phenomena are so complex and different methods are needed to best understand these complexities; and help to strengthen the assessment of the issue by supplementing one approach with others (Best and kahan, 1999). It would also help the researcher to freely use different research methods so as to get comprehensive information in studying the proposed problem than either quantitative or qualitative method alone. In addition, the researchers used qualitative approach considering it as a suitable strategy to the current study in that interview, document analysis and observation on students' departmental selections helps them capture the various sorts of subject experiences on the topic. Gray,(2004) indicates that the reason for choosing qualitative method to collect data is the need to attain highly personalized data that there are opportunities for probing more in detail and helps the respondents ask for clarifications if they have difficulties with the questions. Furthermore, qualitative approach was also used to triangulate quantitative approach (through questionnaire) and to assure the trust worthiness of the designed information on the issues of the study.

Participants, Sample and Sampling Techniques

Participants of the study

As the major concern of the current study was to assess the perceptions of students towards joining DELL in some selected Ethiopian universities, the participants of the study were selected from Jimma University- a first generation; Wollega University- a second generation; Gambella University- a third generation; and our university - Mettu to be a part of it. The participants from the said universities were all students who joined DELL and some selected students from other social sciences on random sampling techniques plus their instructors, department and faculty representatives. This was done because the issue related to students' perceptions towards DELL is primarily the concern of learners themselves and their instructors, department and faculty representatives. Furthermore, in order to elevate perceptions of students towards DELL, information about it could be best obtained from instructors, department and faculty representatives of DELL and students so as to recommend strategies that would help teachers and students to promote students' perceptions towards specializing in English language and literature.



Sample and Sampling Techniques

The researchers selected the proposed universities purposively because they have been teaching in one of the proposed university and they also think that it would enable them to stay in the area of the study to make reliable inquiry. For the purpose of this study, participants from Jimma, Wollega, Gambella and Mettu University were taken as a sample from Ethiopian universities. All the participants in this study were 360 students majoring in DELL, 400 students from other social science, 77 DELL instructors, four (4) DELL department heads and four (4) faculty (college) representatives. The study focused on this area because the domains of the problem identified are mainly these groups. Among the whole population, all DELL students and 10% of students in social science and humanities from each year were selected by applying simple random sampling based on Sharma's (2000) suggestion that reports, 10 – 20% of accessible population can be taken as sample in descriptive survey study. For DELL staff, department heads and faculty participants, since the number of these groups on the job are 85, all of them were selected. And, extreme caution was given to ensure participation to be free from any doubt. That is, both students and teachers participants were guaranteed that the information they were providing would only be used for the research purpose and confidentiality was taken that they should not worry to provide genuine idea.

Data Collecting Instruments

The choice of data collection method is determined by the needs of a given research project and research design in particular by the research questions confronted. Taking this into consideration, the researchers have included both quantitative and qualitative data gathering tools: Questionnaires, interview (semi structured), observation and document analysis were data gathering tools in the current study.

Interview

The researchers employed a semi-structured interview because it enabled them to investigate relevant information from the respondents by raising different questions. The interview was contain open ended questions which were related to the knowledge and practice of specializations in English language and literature that was enable the researchers to understand the perceptions of the respondents towards DELL. This instrument is preferred to get appropriate information (direct information), free discussion and response and flexibility that could not be obtained through other data collecting instruments (Salinger and Shohamy, 1989). Interview was used so as to get subjective descriptions of interviewees own perspectives about the perceptions of students towards DELL. It was hoped that this data collecting instrument responded to what is inside students about DELL.

Document analysis

The researchers believe that taking and examining fifteen randomly selected students' documents from each universities help them to identify what background the students have at their high schools and preparatory levels. This in turn gives clue about students attitude towards the subject. Besides, it helps them to identify why or why not the student likes/dislikes DELL. Therefore, document analysis was employed on randomly selected students' documents of both DELL and other social science using pre-designed own checklists. Beside triangulating students former level on English, the documents under analysis provided sort of information that could not be reached with other tools.

Observation

The researchers employed non-participant observation technique to collect relevant data from the new students joining DELL. Here, the researchers observed how instructors boost the importance, usefulness, demands, fate etc of the graduates of the department (DELL) to the new students (if there exists any briefings; a kind of information that may attract the new once). These researchers also observed the attitude the newly arriving students have about DELL. i.e if they like or dislike the department. To carryout this, the researchers developed their own checklist. Hancock (1999:89) says, because of the richness and credibility of information it can provide, observation is



a desirable part of data gathering tool. This helped the researchers to get more compiled and complete the prevalent effect of department's plan of invitation to attract and encourage students toward English specialization that was raised by sample respondents during questionnaire and interview. According to Shohamy (1989) data gathered through observation can provide insights, which could not be available through research methodologies dependent of a single approach. Therefore, observation in the actual setting during departmental selection was the task of the researcher.

Questionnaire

There searchers designed questions for two categories: students and instructors, department heads and faculty representatives. The questions were both factual and to some extent opinionated that are close-ended and open-ended.

Questionnaires to assess the students' perceptions' toward their English subject potential (attitude toward the subject), their perception of their ability to cope with English learning and achieving the desired goals in terms of English proficiency (Linguistic self-confidence) and their general level of anxiety when they have to use English in their current class (L2 classroom anxiety). This questionnaire consist a set of items which rates 1 (not at all true) to 6 (very true) on a likert scale.

Moreover, the researchers designed own checklist for instructors, department heads and faculty representatives to elicit more on what they think would be the root causes for the students' perceptions towards DELL.

Procedures of Data Collection

Data were collected in the second semester right after the first semester break, to ensure that students had been very acquainted with the class and their teaching learning environment. The researchers had the approval of the university research coordinators team (RCT) after introducing their work to them (RCT). The researchers also introduced themselves to the students and instructors, department heads and faculty representatives showing the university RCT letter that witness their formally being involved in the work. After checking whether everyone had agreed to take part in the survey, the researchers oriented the participants briefly about the study and encourage asking questions about anything they found unclear with respect to the contents, the languages and the way to deal with the research tools. They assured them (the respondents) that their response would be kept confidential in that it is anonymous and the researchers themselves collected the questionnaire. The questionnaires were distributed to the sample students of the study in the presence of the researchers in the normal class time and later all questionnaires were collected.

The interview session was conducted on the basis of random selection for non- DELL students and for all DELL students. However, it was for all instructors (English language and literature), department heads and faculty representatives, and it was proposed to last for half an hour depending on the duration of the respondent's responses. To carry this out, first the respondents of the interview were informed the purpose of the interview. The response of the interviewees was audio taped (recorded) for later analysis. The researchers also wrote down the respondent's responses.

In addition to this, the researchers also administered the other tool, the observation, at the very verge of students' admission to their respective departments.

Data Analysis Procedures

To assess the existing students' perceptions towards DELL a descriptive statistical procedures in percent form was made. The data from questionnaire were analyzed in such a way that frequencies were counted for each never, rarely, occasionally, often and very often responses. The extents of frequency of responses were set in percentage form in tables for which more descriptions and explanations were given in this study. In addition to this, responses from other tools was orchestrated and triangulated qualitatively and quantitatively. From this, data analyses and



discussions were made integratively. Finally, summary, conclusions and recommendations were provided.

DATA ANALYSIS AND INTERPRETATION

This chapter provides an indepth analysis of the main findings of the study.

Relevant aspects of students' perceptions towards joining DELL in Mettu, Gambella, Wollega, and Jimma Universities were discussed and interpreted. Karahan (2007) asserts that "positive perceptions let the learner have positive orientations towards learning English language." Researchers, teachers, and learners agree that a high motivation and a positive attitude towards second language and/or foreign language and its community help second language learners to acquire the language effectively (De Bot, et.al.2005). For this reason, the current study presented some of the most striking results obtained from the preliminary analysis of the statements presented in different tables that indicated: one, students' English subject matter potentials. This means, students' perceptions toward the English subject. The second one was perception of students' ability to cope with English learning and achieving the desired goals in terms of English proficiency. It is perceptions toward linguistic self-confidence by the students. The third interpretation was students' general level of anxiety when they have to use English in their current class, which is a perception toward L2 classroom anxiety were pointed addressed in three different tables to investigate students' perceptions towards joining department of English Language and literature in Jimma, Mettu, Gambella and wollega Universities.

Results from questionnaires

Table 1: Perceptions Toward the English Subject matter potentials (%)

SN	Statements	Universities	SA	A	NC	D	SD
1	I like to practice English the way native speakers do	Jimma	-	13	30	36	21
		Mettu	-	11	27	42	20
		Gambela	9	20	30	28	13
		Wolega	-	3	28	41	29
		Average	2.25	11.75	28.75	36.75	20.75
2	Studying English helps me to have good re/ships with friends	Jimma	2	14	23	36	25
		Mettu	-	1	31	35	33
		Gambela	2	16	27	34	21
		Wolega	3	7	29	30	31
		Average	1.25	9.5	27.5	33.75	27.5
3	When I hear a students in my class speaking English well, I like to practice speaking with him/her	Jimma	2	8	26	32	32
		Mettu	1	6	23	34	36
		Gambela	6	9	20	31	34
		Wolega	2	9	27	30	32
		Average	2.75	8	23.75	31.75	33.5
4	Studying English helps me to improve my personality	Jimma	-	-	32	35	33
		Mettu	-	-	30	38	31
		Gambela	3	8	29	32	28
		Wolega	-	-	28	38	34
		Average	.75	2	34.25	35.75	26.5
5	Speaking English anywhere makes me feel worried	Jimma	27	34	26	7	6
		Mettu	27	35	29	5	4
		Gambela	8	6	27	34	25
		Wolega	25	36	29	6	4
		Average	21.75	27.75	27.75	13	9.75
6	I put off my English homework as much as possible	Jimma	22	27	31	14	6
		Mettu	20	24	33	13	10
		Gambela	12	16	36	24	12
		Wolega	21	26	31	12	10
		Average	18.75	23.25	32.75	15.75	9.5



7	I am not relaxed whenever I have to speak in my English class	Jimma	24	34	29	7	6
		Mettu	28	33	30	6	3
		Gambela	10	12	31	27	20
		Wolega	23	30	29	10	8
		Average	21.25	27.25	29.75	12.5	9.25
8	I feel embarrassed to speak English in front of other students	Jimma	43	46	11	-	-
		Mettu	40	39	21	-	-
		Gambela	18	21	22	31	8
		Wolega	41	39	14	4	2
		Average	38	36.25	17	8.75	2.5
9	From the beginning I don't like English subject	Jimma	31	23	22	18	16
		Mettu	32	34	22	9	3
		Gambela	21	20	19	32	8
		Wolega	30	32	25	12	11
		Average	28.5	27.25	22	17.75	9.5
10	My language success depends on what I do in the class	Jimma	8	8	29	30	25
		Mettu	5	10	33	29	23
		Gambela	27	28	31	8	6
		Wolega	7	9	31	28	25
		Average	11.5	13.75	28.5	23.75	19.75



Table one above, elicited students' positive and negative responses towards their own potential on English subject matter. Among the negative statements to solicit students' perception toward the English subject, 21.75% respondents strongly agreed and 27.75% respondents agreed that Speaking English anywhere makes them feel worried. And, 13% of the respondents agreed and 9.75% of the respondents strongly agreed to the same statement. That is, 49.5% of the respondents reacted positively to the negative statements and only 22.75% of the respondents reacted negatively to the negative statements. And the remaining percent of the respondents were not certain to the statement. For the other negative statement, 18.75% and 23.25% of the respondents were strongly agreed and agreed; almost 42%, that they put off their English homework as much as possible. And, 15.75% and 9.5% of the respondents were disagreed and strongly disagreed respectively; almost 25%. Here, about 32.75% of the respondents were uncertain. Yet, 28.5% and 27.25%; about 55.75% of the respondents were strongly agreed and agreed that they didn't like English subject from the very beginning. And only, 17.75% and 9.5%; about 26.25% of the respondents disagreed and strongly disagreed that they didn't like English subject from the very beginning: here, 22% of the respondents were not certain to the same question. From these analyses one can conclude that the respondents had a negative trait to the subject English because negative statements positive responses (strongly agree and agree) were higher in percent than negative responses.

The other thing table one revealed was the positive statements indications about students' perceptions on their own potential for English subject matter. Among the positive statements, 1.25% and 9.5% of the respondents strongly agreed and agreed respectively that Studying English helps them to have good relationships with friends. However, 33.75% and 27.5% of them disagreed and strongly disagreed that Studying English helps them to have good relationships with friends. The comparison here was 10.75% positively responding and 61.25% negatively responding for a positive statement. The other positive statement asked if the respondents liked to practice English the way native speakers do was responded as 2.25% strongly agreed and 11.75% agreed; almost only 14%, however, 36.75% and 20.75% of the respondents strongly disagreed and disagreed respectively; that is 57.5%. This means, when 14% liked practicing native like, 57.5% did not like practicing. Yet, 0.75% strongly agreed and 2% agreed that Studying English helps them to improve their personality. But, 35.75% disagreed and 26.5% strongly disagreed that English helps them to improve their personality.

From the negative statements to solicit students' perceptions, one can conclude that 2/3 of the respondents were sure that they had negative perceptions towards their English subject matter. They felt their potential towards English subject is negative (they feel they cannot cope with English subject). Moreover, from the positive statements, one can understand that all the statements with positive implications had less than 1/4 of the respondents' positive response. That means less than 1/4 of the respondents perceived English subject matter positively. It was beyond their imagination that their English language success depends on what they did in the class and outside the class. It seemed respondents' response for negative statements were high in Percent % as agree and strongly agree and less in percent % as for disagree and strongly disagree; and vice-versa for positive statements. It was less in percent as for agree and strongly agree and high percent for disagreed and strongly disagree.



Table 2: Perceptions toward Linguistic Self-confidence (%)

SN	Statements	Universities	SA	A	NC	D	SD
1	Being good at English will help me study other subjects as well	Jimma	37	33	10	-	-
		Mettu	33	31	16	-	-
		Gambela	48	52	-	-	-
		Wollega	46	41	13	-	-
		Average	33.5	39.25	9.75	-	-
2	I have more knowledge and more understanding when study in English	Jimma	-	-	21	41	38
		Mettu	-	-	19	51	30
		Gambela	32	44	24	-	-
		Wollega	-	-	17	39	44
		Average	8	11	20.25	32.75	28
3	In my opinion, people who speak more than one language are very knowledgeable	Jimma	27	19	40	10	4
		Mettu	2	20	39	25	14
		Gambela	8	19	31	24	18
		Wollega	8	12	28	32	20
		Average	11.25	17.5	34.5	20.25	22.75
4	Studying my subjects using English makes me able to create new thought.	Jimma	9	8	22	29	32
		Mettu	7	9	27	34	23
		Gambela	7	10	40	24	19
		Wollega	-	18	32	29	21
		Average	5.75	11.25	30.25	27	23.75
5	Studying using English helps me communicate in English effectively	Jimma	7	9	27	34	23
		Mettu	9	8	22	29	32
		Gambela	7	11	32	29	21
		Wollega	7	10	40	24	19
		Average	7.5	9.5	30.25	26.5	23.75
6	Frankly, I study English just to pass the exam.	Jimma	16	31	29	16	8
		Mettu	21	28	30	21	-
		Gambela	27	34	22	11	6
		Wollega	32	24	20	14	10
		Average	24	29.25	25.25	15.5	6
7	I cannot apply the knowledge from English subject in my real life	Jimma	30	32	34	4	-
		Mettu	37	35	28	-	-
		Gambela	34	31	28	7	-
		Wollega	41	34	25	-	-
		Average	35.5	33	28.75	2.75	-
8	I am not satisfied with my performance in the English subject.	Jimma	38	31	21	10	-
		Mettu	39	29	19	11	2
		Gambela	17	23	29	29	2
		Wollega	39	26	30	4	1
		Average	33.25	27.25	24.75	13.5	1.25
9	In my opinion, English language is difficult and complicated to learn.	Jimma	27	32	28	11	2
		Mettu	21	34	30	14	1
		Gambela	25	28	31	9	7
		Wollega	24	28	29	13	6
		Average	24.25	30.5	29.5	11.75	4
10	I do not feel good for my joining English language and literature department.	Jimma	41	38	18	3	-
		Mettu	39	35	20	6	-
		Gambela	-	9	23	38	30
		Wollega	37	42	19	2	-
		Average	29.25	31	20	12.25	7.5



The second table of this chapter focused on eliciting students' perceptions towards their own Linguistic Self-confidence. It was the perceptions of students' own ability to cope with English learning and achieving the desired goals in terms of English self-proficiency.

Out of the negative statements to elicit students' linguistic self-confidence, 24.25% of the respondents strongly agreed and 30.5% agreed that in their opinion English language learning (joining the department) was difficult and complicated. And, only 4% strongly disagreed and 1.75% disagreed that English language learning was difficult and complicated. Also, 35.5% strongly agreed and 33% agreed that they cannot apply the knowledge from English subject in their real life; while, only 2.75% disagreed and null strongly disagreed to the same statement (that they cannot apply the knowledge from English subject in their real life). Besides these, 24% of the respondents strongly agreed and 29.25% agreed that frankly they study English just to pass the exams. Here, while 25.25% were not certain about this statement, only 15.5% disagreed. These negative statements responses proved that the respondents' perceptions towards the linguistics self-confidence was too low. Where self-confidence to learn is low, then it was correct to conclude that achieving the desired goal in the subject under learning was difficult to meet. The proof again was negative statements were responded positively (as agree and strongly agree) with higher percentage, and lesser percentages responded negatively (as disagree and strongly disagree).

Moreover, from the positive statements, when 8% of the respondents strongly agreed and 11% agreed, 32.75% disagreed and 28% strongly disagreed that they had more knowledge when study in English. For positive statement, positive responses were less in percentage than negative responses. Here more than 60% of the respondents were dead sure that they did not understand English and studying in English of course, 20.25% were not certain about the statement and only 19% were sure that they could understand. In addition to this, when 7.5% of the respondents strongly agreed, 9.5% of the respondents agreed; almost 17%, that Studying using English helps them to communicate in English effectively. But, 26.5% disagreed and 23.75% strongly disagreed; almost more than 50%, that studying using English helps them to communicate in English effectively. From this one can conclude again that these respondents did not seem to have the ability to cope with English learning and achieving the desired goals in terms of English self-proficiency, because effective communication is realized when one use the language. Yet, another positive statement was responded as 5.75% strongly agreed and 11.25% agreed. But, 27% disagreed and 23.75% strongly disagreed that studying their subjects using English makes them able to create new thought. The ratio here was 16: 50 disagreeing to a positive statement which indicated respondents' linguistics self-confidence was so low. These was why the researchers came to understand that perceptions of students on their own ability to cope with English learning and achieving the desired goals in terms of English self-proficiency was not there or if existed it was too low.



Table 3: Perceptions toward L2 Classroom Anxiety (%)

SN	Statements	Universities	SA	A	NC	D	SD
1	I do not get anxious when I have to answer a question in my English class.	Jimma	-	4	33	37	30
		Mettu	-	-	28	41	31
		Gambala	19	28	36	10	7
		Wollega	-	2	31	39	28
		Average	4.75	8.5	32	31.75	24
2	Studying foreign language like English is enjoyable.	Jimma	4	10	27	32	27
		Mettu	1	6	31	40	22
		Gambala	21	28	41	7	3
		Wollega	6	9	29	34	12
		Average	8	13.25	32	28.25	16
3	Studying English subjects makes me feel more confident.	Jimma	5	6	30	28	31
		Mettu	2	9	27	35	27
		Gambala	19	35	29	10	7
		Wollega	4	8	29	31	28
		Average	7.5	14.5	28.75	26	23.25
4	I look forward to the time I speak in English class.	Jimma	-	-	20	45	35
		Mettu	-	-	27	42	31
		Gambala	21	18	38	13	10
		Wollega	-	3	33	40	24
		Average	5.25	5.25	29.5	35	25
5	Studying English make me have good emotions/feelings.	Jimma	9	11	36	27	17
		Mettu	5	9	32	35	19
		Gambala	17	26	34	14	9
		Wollega	8	10	38	32	12
		Average	9.75	14	35	27	14.25
6	I ask for help in English from other teacher or friends.	Jimma	2	6	26	40	26
		Mettu	3	5	32	41	19
		Gambala	20	32	28	11	9
		Wollega	4	7	31	35	23
		Average	7.25	12.5	29.25	31.75	19.25
7	I like discussions with classmate in small groups using English.	Jimma	13	16	29	24	18
		Mettu	11	13	32	25	19
		Gambala	27	20	24	21	8
		Wollega	15	13	31	22	18
		Average	16.5	15.5	29	20.5	15.75
8	I feel timid speaking English with other people	Jimma	28	32	35	5	-
		Mettu	31	29	30	7	3
		Gambala	6	9	29	31	25
		Wollega	29	34	27	8	2
		Average	23.5	26	30.25	12.75	7.3
9	I am afraid that other students will laugh at me when I speak English.	Jimma	36	40	23	1	-
		Mettu	32	37	26	5	-
		Gambala	11	19	29	26	15
		Wollega	30	25	30	11	4
		Average	27.25	30.25	27	10.75	4.75
10	I can communicate in English without knowing the rule.	Jimma	14	19	28	28	11
		Mettu	12	18	16	31	23
		Gambala	22	26	30	14	8
		Wollega	15	19	22	28	16
		Average	15.75	20.5	24	25.25	14.5



Table 3 of this analysis part interpreted students' perceptions towards L2 classroom anxiety. This was students' general level of anxiety when they had to use English in their current class. As it was shown on the table above, 4.7% of the responded strongly agreed and 8.5% agreed that they did not get anxious when they had to answer a question in their English class. Which was very less compared to 31.75% disagree and 24% strongly disagree to the same statement. For another positive statement 7.5% responded as strongly agreeing and 14.5% agreeing. However, 26% disagreed and 23.25% of them disagreed strongly that Studying English subjects makes them feel more confident. This means, about fifty percent did not feel confident in studying English subject and about 29% of them were not certain if they felt or not. This indicated the researchers that only 1/5th of the students could felt confidence in studying English subject. Yet for another statement 7.25% strongly agreed and 12.5% agreed that they asked for help in English from other teacher or friends. But, 31.75% disagreed and 29% strongly disagreed that they asked for help in English from other teacher or friends. So the majority of students did not use English because they felt anxious while doing so.

On the other hand, the negative statement to solicit anxiety in English class showed 23.5% a strong agreeing and 26% agreeing that the respondents felt timid in speaking English with other people, while 12.75% disagreed and 7.5% strongly disagreed that they felt timid in speaking English with other people. That is, about half felt timid and only less than 1/5th % did not felt timed where about 30% were not sure if they felt so. Also, 27.25% strongly agreed 30.25% agreed that they were afraid that other students would laugh at them when they speak English but, 10.75% disagreed and 4.75% strongly disagreed. These indicated the researchers that students' class room anxiety level was high. Where there is anxiety; the subject under study would not yield the desired achievement. Therefore the students would develop negative perceptions towards that subject.

Across the three table interpretation, the researcher observed that there were absolutely negative perceptions of students towards joining English language learning department. All the discussions through these tables indicated that students had low potentials of English subject matter; they perceived themselves as they were unfit and could not cope with the English subject matter. They also did not consider themselves as they had the ability to use, practice or exercise the language and through these that fluency or proficiency would come. The researchers of this study also understood that students' anxiety in English became high before the learning or studying took places. It resulted from low linguistic self- confidence.

Results from interviews

Teachers interview

The interview results from English teachers of all the four universities were summed up and discussed in brief here in as follows. To solicit students' perception towards joining DELL, is an issue that includes teachers/ instructors; because, they are also stake holders. That is why; the researchers made interviews with lecturers and formulated the conclusion on the bases of the findings.

Instructors were asked if they think the standard of their students were low in English and if that/it had any influence on their/ students future career. Almost all conformed that the standard of their students English were low and all indicated that the low standard they were saying had a great influence on students' career. These instructors stated that the low students' performance in English was not a departmental /specific to one department issue. As they mentioned, low English standard of students was a university as well as a nationwide problem. As one of the instructor at Jimma University reasoned out this, he said:

“ the reason why we observe low performance in students' English these days is that students low exposure to the subject at lower grades and the less commitments/effort



students made by themselves to themselves plus their shyness or afraid of not being laughed at.”

Another instructor from Mettu University complimented this reason saying:

“ it is not only students’ sole problem, but also the English subject teachers at lower level with their poor performance impacted the low standard we are saying here at university level. He also added that the shortage of extra-curricular supplement is low...”

The researchers wanted to know if their / university teachers’/ students approach them/ instructors for assistance using English language. Majority of the instructors replied that even if they/the students wanted to approach using English, they cannot express what they want to communicate. Hence, they/ the students speak using any other language they think their teacher can understand. Here, the researchers of this study would like to note that students at Gambella University had shown much difference in using English. When one of the English instructors at Wollega University reasoned why this was so, he said that, “students lack confidence on the usage as well as the use of English. Since they feel timid not to break the rule of the language, they don’t want to approach anybody using English.” And, another instructor at Gambella University, after he confirmed students not approaching teachers using English, she added “they do not approach us using English because they know that they/students face shortage of words or vocabularies to use.” One final question the researcher presented asked if the instructors though their students had a positive attitude towards English and if they/students perceive English positively. None of the interviewed instructors said ‘yes’. Meaning students did not perceive English positively. Even those who joined the department were not on their choice that they joined it / English department. Because of their poor background in their English, they were negatively influenced and they did not have positive attitude said a teacher at Wollega University.

Students interview

The researchers of this study formulated questionnaires to solicit students’ perceptions towards joining DELL. Since that alone is not enough, they wanted another way of investigating the issue to further the triangulation. Hence, they interviewed students to come up with the following findings.

The first question to the interviewees was asking how they/ the students rate their English performance in a class. The majority of the students replied ‘poor’. And a few said ‘very poor’. Yet, a lesser number of the respondents replied ‘average.’ one thing the researchers wanted to reveal here was none of the respondents said, ‘good’, ‘very good’, or ‘excellent’. This could be the beginning of their self- realization of the students that they are detached from English. Moreover, the respondents replied that they usually learn or study English language only when they were compelled by exams; of course, some of them said they usually learn/ study English language during English class. So, one can conclude from this that students did not like studying English language. And, this could also imply that they had negative attitude towards English language learning. With such negative attitude no one might have a good perception about anything. As the interviewers kept on asking whether the students found learning English language difficult; almost all responded that it was difficult. Only a small number of them said not as such. They even generalized as students did not pass well in English. on this one student from Wollega University said, “ a top scorer in my preparatory school had English subject lesser than any other subjects like biology, chemistry, mathematics, and even physics.....i got an aptitude English mark less compared to other subjects. Yet, another student from Gambella university added by taking his own score as an example. He said, “The least score I have in my national exam was aptitude English followed by English.”

These were indications that scoring less in English was becoming common that began from lower levels. The other response that surprised the interviewer was that the great majority of the



respondents believed that, 'one can be born good at the English language.' This showed the researchers that students came to DELL with low linguistic self-proficiency and negative perceptions. Furthermore, the respondents assured the researchers that they/the students use commonly a local language native to the place (vernacular) when communicating with their teachers or friends than English. As one of the third year student at Mettu University said, unless they use vernacular languages they cannot express their idea to the point. Therefore, either they have to use totally a local language or begin with English and featuring it with local language. Another point the researchers had come up with was that almost none of students came to the department of English language and literature on their first choice. Excluding Gambella University, in the remaining three Universities, almost all joined the department without their choice. For instance, out of 53 students at Wollega University, only 13 students joined English department on their choice. And, out of 44 students at Mettu University in the English department, only one student joined the department on his first choice. Such shying away was nothing, but lack of self confidence in the subject. This came just because of poor background to the subject. Finally, the respondents were asked for their perceptions toward joining DELL; and they said, they perceive DELL negatively. Because, for them English was for someone who born for it. Most of them fear English, majority of them felt timid using English, still others afraid of communicating in it for they might make mistakes while doing so.

Results from document analysis

To triangulate different information from different sources the researchers used different tools. One was document analysis. Results from documents analysis showed that the vast number of students had lower scores and or performance in English compared to other subjects score when they were to join higher institutions. As their document showed majority of them joined English language department without their interest. It was their documents prove that at least three to six or seven students every year went home than joining English department. This happened after they saw that they were assigned to DELL without their choice. Moreover, the documents of those students showed the researchers that more students were dismissed or dropped out relative to other departments' number of dismissal. One reason for this could be that DELL students were studying at a department of not their interest. To supplement this, Dornyei and Csizer(2002) suggested that attitudes ranged through negative, natural and positive states and determine a student's success or failure in his/her learning.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This research study has argued that perceptions are factored in learning English language and literature. As students came to higher institutions with negative perceptions towards English language and literature, their attitude as a fundamental component can improve English language learning. This study provided an insight into the perceptions of students towards joining English language and literature department in some selected Ethiopian universities. The findings of this study indicated students coming from high/ preparatory schools had negative perceptions toward English subjects that they did not want to join DELL. As the finding showed students feel discomfort, timid, shy or afraid of using, exercising, or practicing it. Hence, they find it difficult to be proficient in it.

Moreover, the study showed students did not get exposures or were not given ample opportunities to work on it at their lower levels. It should have been good to make students had the chances to exercise well there at elementary and high schools. Otherwise, when they arrived higher institutions their English class room anxiety would become higher and learning would not come positive. And this finally resulted in a negative perception of the students towards the department



of English. Beside these, students at their lower levels did not have an access to extracurricular programs were they could have gain additional inputs to further their skills and knowledge. The students were opportunist if they had had such extra inputs at their high / preparatory schools that would make them dare English contexts.

Yet, this study also revealed that students commitment to acquire knowledge and skill related to English was so poor that at the end of the day negative perceptions towards English in general and the department of English language and literature in particular occurred. It was the finding of this study that students made no effort or if any, very little in doing learning/ studying. They more often studied/ learnt just to pass in their exams. No extensive effort was carried out by the students, even when tasks were given, the intensive kind, students pretended as if they were doing, some of them were even reluctant.

Recommendations

Based on the findings of this research study, the researchers recommend the following. Since proficiency in English language happens only if students used, exercised, or practiced the language, teachers at lower levels should create those opportunities for their students. And, students English class room anxiety was observed high at higher institution. This could be avoided if students were exposed to different opportunities to use the language. Therefore, this thing should be availed to the students at their high or preparatory schools.

The negative perceptions of students toward joining DELL rooted to the students zero commitment at their grassroots levels. Therefore, it is recommended that students should make any effort possible, including extensive activities, let alone, the teacher guided exercise. Moreover, students' negative feelings (shy, timid, afraid of others etc.) were other contributors of negative perceptions, so these hindrance should be avoided by students self-conscious about their feelings, extreme worry to the mistakes could be corrected.

Acknowledgement

We would like to express our heartfelt gratitude to Mettu University Research directorate for the financial and material support. Without the support given from the university, the success of this research would have been inconceivable.

Our thank also goes to Mettu University, Gambella University, Jimma University and Wollega University English Language and Literature staff members and students for they sacrificed their precious time in filling out questionnaires and responding to the interview.

Mr. Getachew Tolossa, lecturer at Wollega University, Mr. Cher Reck, assistant lecture at Gambella University, and Wagari Deressa, PhD candidate at Jimma University, deserve our appreciation for assisting us in collecting data in their respective Universities.

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