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Effect Of Medicinal Plants Extracts To Control Seed Moulds Of Spices

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ABSTRACT

The effect of leaf extracts of 10, 25 and 50% concentration were tested against the four dominant fungi which were isolated from seeds of different spices. The tested leaf extract found beneficial to control the fungi.

Key words: Leaf extract, Fungi, Spices.

INTRODUCTION

Majority of spices originated in Asiatic tropics and India a home of spices from ancient times and is largest exporter of spices so spices become major objects of commerce. There are About 63 plants that yield that yield spices are cultivated in country. Total area under spice cultivated was 2.60 million hectares and yielding approximate 3.08 million tones during 2001- 02 and earned the foreign exchange about 314 dollars annually, Sharma, (2004). Due to improper handling and storage there is the risk of contamination of spices due to moulds. The fungi associated with the seeds cause several disease resulting heavy loss of yield in stored seeds, loss of viability discoloration, heating and mustiness, production of toxins and loss of weight are major types of losses caused by fungi (Christensen 1965, Bilgrami *et.al.,* 1981, Waghmare *et.al.,* 2007, Chavan, 2007). For effective management of moulds without causing environmental pollution the safe, cheap, ecofriendly and easily available (Singh *et al.,* 2003; Cuthbertson and Murchie, 2005, Braga *et al.,* 2007) some important medicinal plants were screened to management of different seed borne moulds from species.

MATERIALS AND METHODS

Detection Of Seed Mycoflora And Identification.

The procedure for agar plate methods was followed as described by ISTA (1996) and Neergaard (1973). Further identification and confirmations of fungi was done

as per Consult Booth (1971), Dodge (1928), Bessey (1950), Dube (1990), Mukadam (1997) and Mukadam *et.al.*, (2006).

Aqueous extract

Samples (50g) of dried leaves and seeds of were macerated with 100 ml. sterile distilled water in waring blender for 10 min. The macerate was first filtered through double layered muslin cloth and then centrifuged at 4000rpm for 30 min. The supernatant was filtered through Whatman No.1 filter paper and sterilized at 120°C for 30 min. The extract was preserved aseptically in a brown bottle at 5ºC until further use. Mohana and Raveesha. (2006).

Assey

The aqeous leaf extracts of four plants were screened for antifungal activity by agar well diffusion method (Perez et al., 1990) with sterile cork borer of size 6.0mm. the cultures of 48 hours old grown on potato dextrose agar (PDA) were used for inoculation of fungal strain on PDA plates. An aliquot (0.02ml) of inoculum was introduced to molten PDA and poured in to a petridish by pour plate technique. After solidification, the appropriate wells were made on agar plate by using cork borer. In agar well 0.1 ml of 10, 25 and 50 % aqueous leaf extracts of different plant were introduced serially after successful completion of one plant analysis. Incubation period of 24-48 hours at 28^0C was maintained for observation of antifungal activity of plant extracts. The antifungal activity was evaluated by measuring zones of inhibition of fungal growth surrounding the plant extracts. The complete antifungal analysis was carried out under strict aseptic conditions. The zones of inhibition were measured with antibiotic zone scale in mm (Varaprasad *et.al.* 2009).

RESULT AND DISCUSSION:

As per table 1. Eight fungi were isolated from different spices. Maximum incidence of *Aspergillus niger, Fusarium oxysporum* and *Helminthosporium tetramera* were observed on Pepper. The maximum incidence of *Fusarium oxysporium* is observed on Pepper, Fennel and Cumin. Pepper , Mustard and Carawy showed maximum load of Fungi.

It is clear from the results of table 2. the maximum inhibition of *A. flavus* by the aqueous extract of *Adathoda vasaka* and *Vitex nigundo.* Similarly, species of

Helminthosporium is inhibited in case of 50 percent of *Azadirachta indica*, *Adathoda vasaka*, *Jatropa curcas* and *Vitex negendo* aqueous extracts. It is interesting to note that 25% of Aqueous extract of *Azadirachta indica* beneficial to control of species of *Curvularia lunata* followed by *Vitex negendo* and *Jatropa curcas*. The growth of *F.oxysporum* is inhibited in 50% extract of *Vitex negendo* and *Jatropa curcas* followed by *Azadirachta indica* and *Adathoda vasaka*. 50% aqueous extract *Vitex negundo* found effective to controle *A. flavus, Helminthosporium tetramera, F. oxysporum and Curvularia lunata* similar pattern observed in *Adathoda vasaka* and *Jatropa curcas* in case of *Aspergillus flavus* and *Helminthosporium tetramera*.

From this study it is observed that the inhibitory potentials of leaf extracts were effective against fungi, whereas some extracts were more potential to inhibit the growth of fungi. The Results supports the findings of Chavan (2006) and Bhagwan M. Waghmare, *et.al.,* (2007), Varaprasad *et.al.,* (2009)and Gorgile (2011).

Table 1. Incidence of fungi from different seeds of species on GNA Plate

Fungi	Pepper	Fennel	Cumin	Mustard	Carawy
Aspergillus flavous	08	07	-	10	10
Aspergillus niger	25	-	10	08	05
Aspergillus ustus	05	-	05	05	10
Curvularia lunata	15	12	-	08	08
Fusarium oxysporum	25	25	25	10	05
Fusarium dimerum	-	05	10	15	-
Helminthosporiu tetramera	25	-	10	08	05
Penicillium notatum	-	-	-	05	05

Table 2. Effect of plant extract on growth of different fungi

Fungi	*Azadirachta*			*Adathoda*			*Jatropa*			*Vitex*			Control
	% of leaf Extract												
	10	25	50	10	25	50	10	25	50	10	25	50	
Aspergillus flavus	0.3	0.4	0.4	0.3	0.2	0.1	0.4	0.2	0.2	0.4	0.3	0.1	0.4
Helminthosporium	0.4	0.2	0.1	0.4	0.2	0.2	0.3	0.3	0.1	0.3	0.2	0.1	0.4

tetramera													
Curvularia lunata	0.3	0.1	0.1	0.4	0.3	0.1	0.4	0.2	0.2	0.3	0.2	0.2	0.3
Fusarium oxysporium	0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.3	0.1	0.4	0.2	0.1	0.4

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Toxicity Evaluation Of Copper Acetate to the Freshwater Fish, *CirrhinusMrigala*And Effect Of Sub Lethal Concentration Of Copper Acetate At 96 Hours LC_{50} On The Histology Of Gill.

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Abstract

Water pollution has become a global problem as various pollutants like heavy metals and toxic chemicals are discharged without prior treatment into the water bodies get polluted with pesticides, heavy metals etc. Among from heavy metals pose a serious health risk on human population and aquatic organisms. The present paper is focused on the toxicity evaluation of copper acetate to the fresh water fish, *Cirrhinusmrigala.* Acute toxicity tests were carried out in the laboratory conditions. The LC_{50} values of Copper acetate for 24, 48, and 96 hours exposure to freshwater fish, *Cirrhinusmrigala*were calculated. The acute toxicity test was performed according to the standard methods in APHA and the value was calculated by Probit analysis by Finney, D.J. (1971). The results showed that in bioassay test Lc_{50} of Copper acetate were analyzed values for 24, 48 72 and 96 hours were 2.27, 2.07, 1.37 and 1.58 ppm respectively. The work of determination of toxicity of Copper acetate, toxicity also clears that LC_{50} values decrease with increase in exposure period suggesting that with increase in duration of exposure the copper acetate become toxic even at low concentration to the fish. The gill of fish exposed to Copper acetate at 96 hr. LC_{50} is1.58 ppm and the gills exhibited histopathological changes partial degeneration of epithelium of secondary gill lamellae, vacuolation, and fusion, degeneration of gill lamellae, shortening and fusion of secondary gill lamellae resulting in reduction of respiratory surface and vacuolization was also observed.

Key Words: Copper acetate, Acute toxicity (LC_{50}), *Cirrhinusmrigala,* gill histopathology.

INTRODUCTION

Heavy metal contamination may have devastating effects on the ecological balance of the recipient environment and a diversity of aquatic organisms (Farombi, *et.al*., 2007;Vosyliene *et.al*., 2006).Among animal species, fishes are the inhabitants that cannot escape from thedetrimental effects of these pollutants [Olaifa, *et.al.,* 2004]. Fishes have direct economic importance and are quite sensitive to the wide array of pollutants discharged in the

aquaticecosystems. Fishes are widely used to assess water quality of aquatic ecosystems because they serve as pollution bioindicators(Lopes *et.al*., 2001; Williams and Holdway).

Aquatic toxicity may be considered in terms of either acute or chronic effects on the species present in a given ecosystem.Acute toxicity involve harmful effects to an organism through short-term exposure chronic toxicity is the ability of a substance to cause harmful effects over an extendedperiod, usually on repeated or continuous exposure lasting a substantial portion of the life of exposed organism.Several approaches have been taken to derive estimates of the acute and chronic eco-toxicological effects of heavy metals in fresh water. In general, toxicology tests are not primarily designed to demonstrate that a chemical is safe, but rather characterize the effects, a chemical can produce or not. The purpose of these tests is to provide vast data to use in risk evaluation.

Histology is a mechanism which can provide an indication of fish health by determining early injury to cells. Therefore, it is an important tool to determine the effect of pollutants on fish tissues. The gills of fish are the main target organs for toxic action of chemical pollutants, as well as detoxification process. It has frequently been used in the assessment of aquatic pollutants in fresh water habitats (Nwani, *et.al,* 2001). This present study aimed at examining the acute toxicity of copper nitrateand effecton gill exposed toCopper acetate on the freshwater fish, *Cirrhinusmrigala*.

MATERIALS AND METHODS

The fishes were collected from Godavari River at Nanded and they were acclimatized in the laboratory conditions for 15 days. The stock solution of Copper acetate was prepared and the fish fingerlings were treated with various concentrations ranging from 1.2 ppm to 2.8ppm.These were conducted over a wide range of concentrations using only tenfish at each concentration in glass aquaria. The copper acetate concentrations were made from 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6 and 2.8. Acute toxicity tests were conducted fordifferent hours. In this period observations on fish mortality were recorded 24, 48, 72 and 96 hours and calculated the LC_{50} value.In the present study, LC_{50} values for different intervals of time of copper acetate for fish *Cirrhinusmrigala* was determined by statistical method suggested by Finney, D. J. (1971).

Acclimated fish fingerlings were exposed to a sub-lethal concentration of LC_{50} of copper acetate (1.58ppm). Controls for the tested fish were set parallel to the experiment. The exposed fishes were sacrificed. From fish the gills were removed, fixed in formalin and then processed routinely for histological studies according to (Mahoney R., 1984).

RESULTS AND DISCUSSION

In bioassay test LC_{50} of Copper acetate were analyzed values for 24, 48 72 and 96 hours were 2.27, 2.07, 1.37 and 1.58 ppm by Probit analysis are represented in table no. 1, 2, 3 and 4 respectively. The acute toxicity results showed that no mortalities occurred in control group throughout the experiment. There was rise in the rate of mortality of fingerlings with increase in concentration of Copper acetate.Abdullah *et al*. (2007) determined the 96 hr LC_{50} and lethal toxicity of iron, zinc, lead, nickel and manganese to three age groups of, *Labeorohita*. The fish were significantly sensitive to nickel, followed by that of lead, zinc, iron and manganese. The 90 days fish showed significantly higher tolerance against all the metals than that of 60 and 30 day fish.

Shelke and Wani (2015) working on comparative toxicity study of heavy metals $HGCL_2$, AS_2O_3 & $CDCL_2$ to Freshwater Teleost Fish, *Amblypharyngodonmola*and observed that theLC_{50}values for 24 & 96 hours were calculated $HgCl_2$ reported 2.0253 & 0.1941 ppm values respectively . The LC_{50} values for As_2 O_3 were 1.9418 & 0.9543 ppm respectively, the LC_{50} values for $CdCl_2$ was 5.1970 & 3.1109 ppm respectively. They concluded that it is quite clear that the *Amblypharyngodonmola*is more sensitive to the tested heavy metal mercuric chloride. According to the toxicity of these heavy metals to the fishes, they can be arranged as $HgCl_2$> As_2 O_3>$CdCl_2$.In the present investigation similar results were obtained as per the Lc_{50} of $Hgcl_2$. Muneesh Kumar *et.al* (2015) studied on the determination of median tolerance limit (LC_{50}) of *clariasbatrachus* for zinc sulphate and copper sulphateand observed that the LC_{50} values for ZnSo4, $CuSo_4$ were as 8.21ppm, 1.85 ppm respectively. They concluded that in sub lethal concentration it may not be fetal for an individual organism but it does affect the growth rate and reproduction resulting in disturbance to whole community and tropic levels of food chains, ultimately the ecosystem. In the present study similar finding were observed the acute toxicity of Copper acetate at 96 hr. Lc_{50} is 1.58 ppm.

The microscopic examination of photomicrograph of the vertical section of the control gill shows the primary gill lamellae. Each primary gill lamellae bears a series of secondary gill lamellae. The secondary gill lamellae of the gill in control fish appeared as leaf like structure. It is clearly shows the primary gill lamellae and secondary gill lamellae with gill arch and piller cells are clearly seen in the control group (Fig. A).

The fish exposed to lethal concentration of copper acetate for 96 hours at 1.58 ppm gill showedwere partial degeneration of epithelium of secondary gill lamellae, vacuolation, fusion, degeneration of gill lamellae and separation of basement membrane whereas the shortening of secondary gill lamellae, thickness and fusion of primary gill lamellae and Fusion of secondary

gill lamellae resulting in reduction of respiratory surface and vacuolization was also observed (Fig. B). The severe lamellar fusion, hyperplasia, hypertrophy and epithelial lifting, swelling and deformed lamella, in some parts sloughing off and curving of lamellae was also observed in gills observed on heavy metal toxicity (Cu, Ni, Fe, Co, Mn, Cr, Zn) to the histology of *Mastacembelusarmatus* by MehjbeenJaved and NazuraUsmani (2013). Similar observation made by Subburaj*et.al.,* (*2015*) studied on sub-lethal effect of zinc on gill histopathology of goldfish and observed that the vacuolation, hyperplasia, epithelial lifting and lamellar fusion, shrinkage of blood vessels, secondary lamellar damage, breakdown of epithelial cells, blood congestion and necrosis. Mohammed Jasim (2015) working on histological effect of some pollutants on fish and water of E. Garraf river and reported that the several histological changes in gills of some fish studied represented by thickness of lamella, congestion and sinus of the primary lamellar layer, epithelial tissue showed area of hyperplasia with accumulation of mucus cells at the edge of the secondary lamella (clubbing of secondary lamella) and hemorrhage.

CONCLUSION

In the present investigation acute toxicity results showed that the LC_{50} values deceased with increased in exposure period suggesting that with increase duration of exposure the heavy metals become toxic even at lower concentrations. Histopathological alterations in tissues studies induced lethal concentration of copper acetate for 96 hr were found to be dose dependent. The toxicity of copper acetate to change the histo-architecture of tissues. Since gills are in direct contact to the toxic medium maximum damage was observed the gills exhibited histopathological changes partial degeneration of epithelium of secondary gill lamellae, vacuolation, and fusion, degeneration of gill lamellae, shortening and fusion of secondary gill lamellae resulting in reduction of respiratory surface and vacuolization was also observed. Discoloration of the skin compared to the control.

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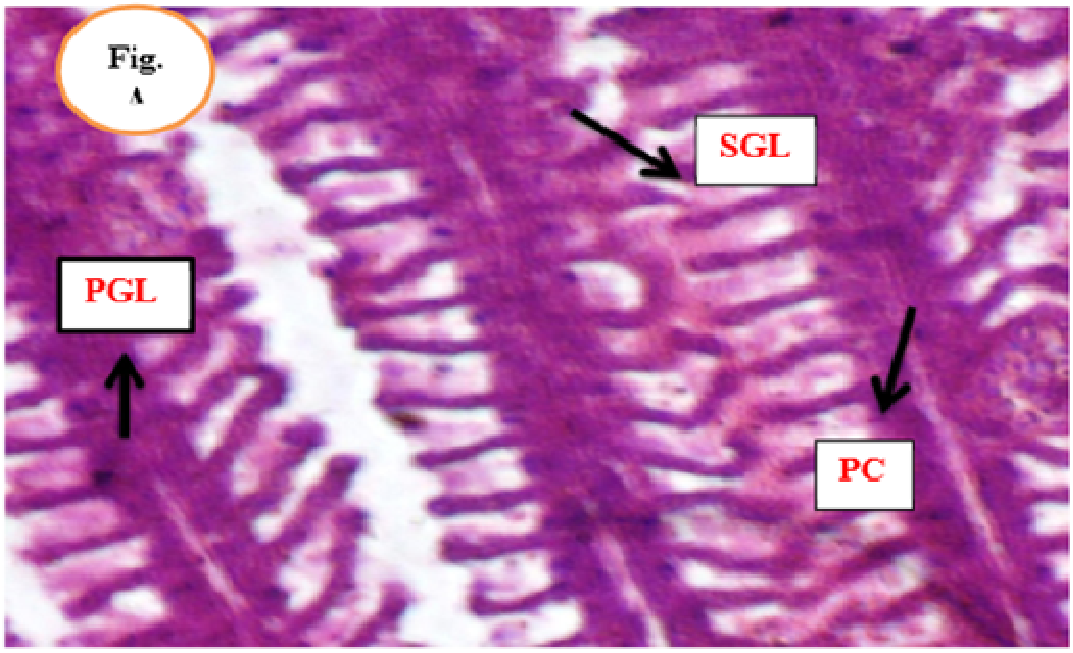

Fig. (A) Photomicrograph of the gill section of control fish *Cirrhinusmrigala*showing the primary gill lamellae (PGL), secondary gill lamellae (SGL) and pillar cells (PC)

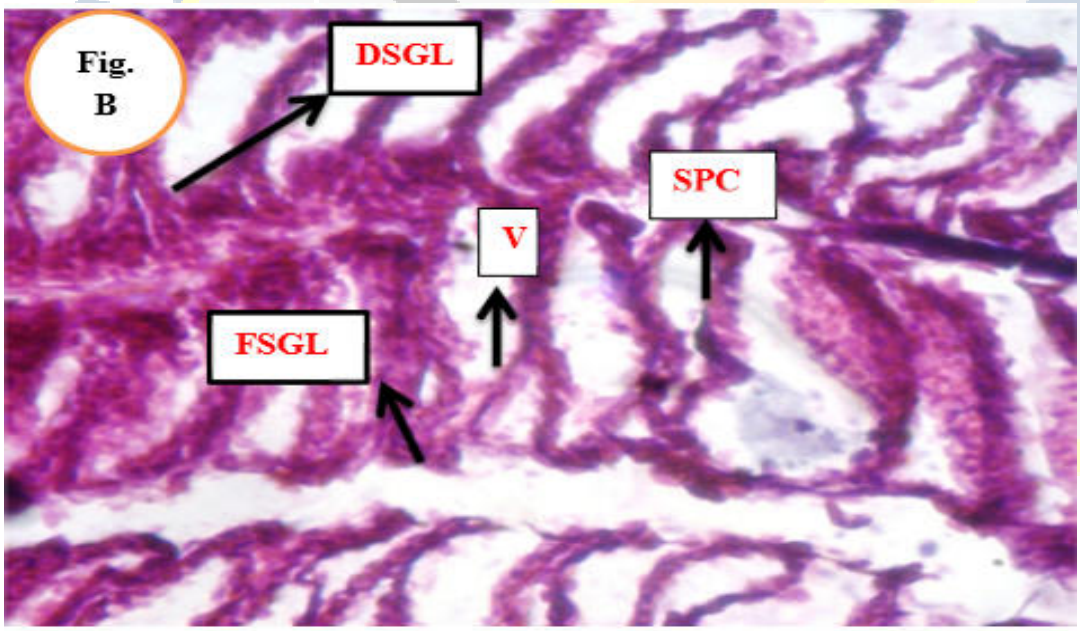

Fig. (B) Photomicrograph of gill section exposed to Copper acetate at 96 hours LC_{50} showing degeneration of secondary gill lamellae (DSGL), Voculation (V), Fusioin of secondary gill lamellae (FSGL) and separation of pillar cells (SPC.)

Table No.1 Calculations of regression equation for LC $_{50}$ of Copper acetate to the freshwater fish *Cirrhinusmrigala*for 24 hours. (Probit analysis by Finney, D.J., 1971)

Sr. NO.	Conc. In PPm	Log Conc (X)	No.of animal Exposed(N)	No. Of Mortality	% Mortality P =100 r/n	Emperical Probit	Expected Probit (y)	Weighing Coefficient (w)	Weight W= nw	Working Probit (Y)	WX	WY	WX2	WY2	WXY
1	1.8	0.2553	10	1	10	3.7184	3.7	0.33589	3.3589	3.719	0.8571	12.4917	0.2186	46.4566	3.1878
2	2.0	0.3010	10	2	20	4.1584	4.1	0.47144	4.7144	4.159	1.4190	19.6071	0.4271	81.5459	5.9017
3	2.2	0.3424	10	4	40	4.7467	4.7	0.61609	6.1609	4.747	2.1094	29.2457	0.722	138.8297	10.0137
4	2.4	0.3802	10	6	60	5.2533	5.2	0.62742	6.2742	5.252	2.3854	32.9520	0.9066	173.0643	12.5283
5	2.6	0.4150	10	8	80	5.8416	5.8	0.50260	5.0260	5.841	2.0852	29.3568	0.8649	171.4730	12.1801
6	2.8	0.4472	10	9	90	6.2816	6.2	0.37031	3.7031	6.281	1.6560	23.2591	0.7402	146.0906	10.4015
Total									**29.2375**		**10.5121**	**146.9124**	**3.8794**	**757.4601**	**54.2131**

$$\overline{X} = \frac{Swx}{Sw} = \frac{10.5121}{29.2375} = 0.3595$$

$$\overline{Y} = \frac{Swy}{Sw} = \frac{146.9124}{29.2375} = 5.0247$$

$$b = \frac{Swxy - \left(\overline{X}xSwy\right)}{Swx^2 - \left(\overline{X}xSwx\right)}$$

$$b = \frac{54.2131 - (0.3595x146.9124)}{3.8794 - (0.3595x10.5121)}$$

$$= \frac{54.2131 - 52.8150}{3.8794 - 3.7790}$$

$$b = \frac{1.3981}{0.1004}$$

$$b = 13.9252$$

$$\mathrm{Re}\,gressionEquation -$$

$$y = \overline{y} + b\left(x - \overline{x}\right)$$

$$y = 5.0247 + 13.9252\left(x - 0.3595\right)$$

$$Y = 5.0247 + 13.9252x - 5.0061$$

$$y = (13.9252)x + 0.0186$$

$$y = 5, x = ?$$

$$5 = (13.9252)x + 0.0186$$

$$5 - 0.0186 = (13.9252)$$

$$x = \frac{4.9814}{13.9252}$$

$$Anti\log ofx = 0.3577$$

Lc_{50}for24hours = 2.279ppm

Table No.2 Calculations of regression equation for LC $_{50}$ of Copper acetate to the freshwater fish *Cirrhinusmrigala*for 48 hours.(Probit analysis by Finney, D.J., 1971).

Sr.NO.	Conc. In PPm	Log Conc (X)	No.of animal Exposed(N)	No. Of Mortality	% Mortality P =100 r/n	EmpericalProbit	Expected Probit (y)	Weighing Coefficient (w)	Weight W= nw	Working Probit (Y)	WX	WY	WX2	WY2	WXY
1	1.6	0.2041	10	1	10	3.7184	3.7	0.33589	3.3589	3.719	0.6855	12.4917	0.1397	46.4566	2.5495
2	1.8	0.2552	10	2	20	4.1584	4.1	0.47144	4.7144	4.159	1.2031	19.6071	0.3069	81.5959	5.0037
3	2.0	0.3010	10	5	50	5.0000	5.0	0.63062	6.3062	5.000	1.8981	31.5310	0.5713	157.6500	9.4908
4	2.2	0.3424	10	6	60	5.2533	5.2	0.62742	6.2742	5.252	2.1482	32.9520	0.7353	173.0643	11.2827
5	2.4	0.3802	10	7	70	5.5244	5.5	0.58099	5.8099	5.523	2.2089	32.0880	0.8395	177.2222	12.1998
6	2.6	0.4149	10	9	90	6.2816	6.2	0.37031	3.7031	6.281	1.5364	23.2591	0.6373	146.0906	9.6502
Total									**30.1667**		**9.6802**	**151.9289**	**3.2300**	**782.0796**	**50.1767**

$$\overline{X} = \frac{Swx}{Sw} = \frac{9.6802}{30.1667} = 0.3208$$

$$\overline{Y} = \frac{Swy}{Sw} = \frac{151.9289}{30.1667} = 5.0363$$

$$b = \frac{Swxy - \left(\overline{X}xSwy\right)}{Swx^2 - \left(\overline{X}xSwx\right)}$$

$$b = \frac{50.1767 - \left(0.3208x151.9289\right)}{3.2300 - \left(0.3208x9.6802\right)}$$

$$= \frac{50.1767 - 48.7387}{3.2300 - 3.1054}$$

$$b = \frac{1.438}{0.1246}$$

$$b = 11.5409$$

$$\text{Re}\,gressionEquation -$$

$$y = \overline{y} + b\left(x - \overline{x}\right)$$

$$y = 5.0363 + 11.5409\left(x - 0.3208\right)$$

$$Y = 5.0363 + 11.5409x - 3.7023$$

$$y = (11.5409)x + 1.334$$

$$y = 5, x = ?$$

$$5 = (11.5409)x + 1.334$$

$$5 - 1.334 = (11.5909)$$

$$x = \frac{3.666}{11.5409}$$

$$Anti\log ofx = 0.3162$$

Lc$_{50}$for48hours = 2.071ppm

Table No.3 Calculations of regression equation for LC $_{50}$ of Copper acetate to the freshwater fish *Cirrhinusmrigala*for 72 hours.(Probit analysis by Finney, D.J., 1971).

Sr.NO.	Conc. In PPm	Log Conc (X)	No.of animal Exposed(N)	No. Of Mortality	% Mortality P =100 r/n	EmpericalProbit	Expected Probit (y)	Weighing Coefficient (w)	Weight W= nw	Working Probit (Y)	WX	WY	WX2	WY2	WXY
1	1.4	0.1461	10	1	10	3.7184	3.7	0.33589	3.3589	3.719	0.4907	12.4917	0.0715	46.4566	1.8250
2	1.6	0.2041	10	3	30	4.4756	4.4	0.55788	5.5788	4.475	1.1386	24.9651	0.2320	111.7188	5.0953
3	1.8	0.2552	10	5	50	5.0000	5	0.63662	6.3662	5.000	1.6246	31.8310	0.4144	159.1550	8.1232
4	2.0	0.3010	10	7	70	5.5244	5.5	0.58099	5.8099	5.523	1.7487	32.0880	1.7487	177.2222	9.6585
5	2.2	0.3424	10	8	80	5.8416	5.8	0.50260	5.0260	5.841	1.7209	29.3568	0.5890	171.473	10.0517
6	2.4	0.3802	10	9	90	6.2816	6.2	0.37031	3.7031	6.281	1.4079	23.2591	0.5350	146.0906	8.8431
Total									**29.8429**		**8.1314**	**153.992**	**3.5906**	**812.1162**	**43.5968**

$$\overline{X} = \frac{Swx}{Sw} = \frac{8.1314}{29.8429} = 0.2724$$

$$\overline{Y} = \frac{Swy}{Sw} = \frac{153.992}{29.8429} = 5.1600$$

$$b = \frac{Swxy - \left(\overline{X}xSwy\right)}{Swx^2 - \left(\overline{X}xSwx\right)}$$

$$b = \frac{43.5968 - \left(0.2724x153.992\right)}{3.5906 - \left(0.2724x8.1314\right)}$$

$$= \frac{43.5968 - 41.9474}{3.5906 - 2.2149}$$

$$b = \frac{1.6494}{1.3757}$$

$$b = 1.1989$$

$$\text{Re}\,gressionEquation -$$

$$y = \overline{y} + b\left(x - \overline{x}\right)$$

$$y = 5.1600 + 1.1989\left(x - 0.2724\right)$$

$$Y = 5.1600 + 1.1989x - 0.3265$$

$$y = (1.1989)x + 4.8335$$

$$y = 5, x = ?$$

$$5 = (1.1989)x + 4.8335$$

$$5 - 4.8335 = (1.1989)$$

$$x = \frac{0.1665}{1.1989}$$

$$Anti\log ofx = 0.1388$$

Lc_{50}for72hours = 1.377ppm

Table No.4 Calculations of regression equation for LC $_{50}$ of Copper acetate to the freshwater fish *Cirrhinusmrigala*for 96 hours.(Probit analysis by Finney, D.J., 1971).

Sr.NO.	Conc. In PPm	Log Conc (X)	No.of animal Exposed(N)	No. Of Mortality	% Mortality P =100 r/n	EmpericalProbit	Expected Probit (y)	Weighing Coefficient (w)	Weight W= nw	Working Probit (Y)	WX	WY	WX2	WY2	WXY
1	1.2	0.0792	10	1	10	3.7184	3.7	0.33589	3.3589	3.719	0.2660	12.4917	0.0208	46.4566	0.9893
2	1.4	0.1461	10	3	30	4.4756	4.4	0.55788	5.5788	4.475	0.8150	24.9651	0.1188	111.7188	3.6474
3	1.6	0.2041	10	5	50	5.0000	5.0	0.63662	6.3662	5.000	1.2993	31.8310	0.2648	159.1550	6.4967
4	1.8	0.2552	10	7	70	5.5244	5.5	0.58099	5.8099	5.523	1.4826	32.0880	0.3782	177.2222	8.1888
5	2.0	0.3010	10	8	80	5.8416	5.8	0.50260	5.0260	5.841	1.5128	29.3568	0.4553	171.4730	8.8364
6	2.2	0.3424	10	9	90	6.2816	6.2	0.37031	3.7031	6.281	1.2679	23.2591	0.4340	146.0906	7.9639
Total									**29.8429**		**6.6436**	**153.992**	**1.6719**	**812.1162**	**36.1225**

$$\overline{X} = \frac{Swx}{Sw} = \frac{6.6436}{29.8429} = 0.2226$$

$$\overline{Y} = \frac{Swy}{Sw} = \frac{153.992}{29.8429} = 5.1601$$

$$b = \frac{Swxy - \left(\overline{X}xSwy\right)}{Swx^2 - \left(\overline{X}xSwx\right)}$$

$$b = \frac{36.1225 - \left(0.2226x153.992\right)}{1.6719 - \left(0.2226x6.6436\right)}$$

$$= \frac{36.1225 - 34.8021}{1.6719 - 1.4788}$$

$$b = \frac{1.3204}{0.1931}$$

$$b = 6.8379$$

$$\mathrm{Re}\,gressionEquation -$$

$$y = \overline{y} + b\left(x - \overline{x}\right)$$

$$y = 5.1601 + 6.8379\left(x - 0.2226\right)$$

$$Y = 5.1601 + 6.8379x - 1.5221$$

$$y = (6.8379)x + 3.638$$

$$y = 5, x = ?$$

$$5 = (6.8379)x + 3.638$$

$$5 - 3.638 = (6.8379)$$

$$x = \frac{1.362}{6.8379}$$

$$Anti\log ofx = 0.1991$$

Lc_{50}for96hours = 1.581ppm

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Importance of Financial Institutions for Sustainable Development

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Abstract:

Banks play an important and pivotal role in the financial system. They lend directly to companies; they undertake longer-term funding and investment through securitization and cover bond issuance; they use their securities affiliates to participate in under writing debt securities issued by companies, using the banks balance sheet; and they participate in derivates markets including swaps and CDS which affect the cost of capital. A dysfunctional banking system reverberates through all of these channels and may be associated with deleveraging and high risk premium. In particular, the shift from – originate and hold "to an –originate and distribute" approach may have endangered the fundamentals of sound bank business models. Where interbank lending freezes up, securities market activities (including underwriting and derivates transactions) become more difficult, and uncertainty and the cost of capital rise. This affect projects that need longer-term financing, such as infrastructure. The business models of banks, as the recent crisis has shown, are at the very heart of these issues.

Key words :Banking, Insurance, Investment, Development, Environment

Introduction:

The financial sector plays an essential role in providing and channeling financing for investment. Beyond providing short-term finance for business day-to-day operations and other temporary cash requirements, financial institutions, capital markets and institutional investors are also sources of long-term finance that is finance which is available for an extended period of time. The importance of long-term finance lies in its pivotal role in satisfying long-term physical investment needs across all sectors in the economy and specifically in key drivers of growth, competitiveness and employment such as the infrastructure, real estate, R&D and new ventures. Traditionally, banks have been a key player in the financial system, transforming savings into long-term capital to finance private sector investment. Over time, two main changes have taken place in the structure of the financial system. First, the banking model has evolved, becoming increasingly dominated by wholesale markets and in particular derivates, to the detriment of the more traditional deposit-taking and lending activities. Second, disintermediation and the growth of capital markets has led to a shift in the structure of the financial sector, with institutional investor such as pension funds, insurance companies, mutual funds, and most recently, sovereign wealth funds, also becoming central players as providers of long-term capital.

The Commercial Banking Sector:

The greatest potential of the commercial banking sector is in its relationship with Small and Medium sized Enterprises, where banks can be very influential through their lending practices and by providing information. Commercial banks have less influence over most larger companies. There is, however, scope for them to influence consumer behavior through the financial products they offer. Today the most commercial banks have focus on two areas: Firstly many have made considerable progress in developing internal environment management systems to reduce their own environmental impact. Secondly, most banks include some environmental analysis into their credit assessment process although this tends to be focus on liability. The United Nations Environmental Programm (UNEP) has established a statement on Banks and the Environment which over 90 banks have signed, including a substantial number from the EU. It the leading international initiative on banks and environment and is certainly encouraging a number of banks to take the environment seriously. A smaller number of leading banks have taken their activities further, and for instance have started to take a wider view of environmental factor in credit system including developing checklists and other procedures.

The Insurance Sector:

The potential of insurance sector in achieving sustainable development lies in its ability to price various types of environmental risk and to help pay for environmental damage. Potentially environmental issues can affect risks in a number of areas, but to date the industry has taken an issue based approach and has focused on the environment in two main areas:

Environmental Liability has had a seriously adverse affect on the industry, particularly in the US and has resulted in the industry taking a very cautious approach to environmental issues. It is important that in any development of environmental liability in the EU the insurance industry be actively involved and reasonably supportive. Unrealistic expectations of the extent to which the industry can price environmental risks accurately should be avoided.

The industry has also become clearly concerned about the potential impact of Climate change on its business. Changing climate at best undermines the historic basis for evaluating risk and at worst could significantly increase losses, from increased storms and floods, to the extent that even the very viability of the industry could be threatened. In response, the leaders in the

industry have developed a comprehensive set of measures, ranging from an increasing lobbying at the climate change convention, through working with governments on research and preventative measures, to adjusting premiums and their areas of activity.

New Alternative Sources of Financing

In recent years diversification benefits and higher expectations of investment returns are increasingly driving investors to alternative investments, such as private equity, real estate and commodities. Alternative investments generally have lower liquidity, sell in less efficient markets and require a longer time horizon than publicly traded stocks and bonds. Infrastructure is often included in the alternative investments part of the portfolios.

Institutional investors have traditionally invested in infrastructure through listed companies and fixed income instruments. This still remain the main exposure of institutional investors to the sector. It is only in the last two decades that investors have started to recognize infrastructure as a distinct asset class. Since listed infrastructure tends to move in line with broader market trends, it is a commonly held view that investing in unlisted infrastructure – although illiquid – can be beneficial for ensuring proper diversification. In principle, the long-term investment horizon of pension funds and other institutional investors should make them natural investors in less liquid, long-term assets such as infrastructure.

Material Method

This is the descriptive research paper base on secondary data. The literatures is collected from various journals, books, magazines, periodicals, various reports, publications of recent research papers available in different websites.

Barriers to Investment

1.While there is clearly growing interest among pension funds, insurers, SWFs and other institutional investors in infrastructure investments, major challenges remain before a substantial increase in allocations may occur. Among the several challenges the following may be highlighted.

2.Lack of appropriate financing vehicles; only the largest investors have the capacity to invest directly in infrastructure projects. Collective investment vehicles have been available, such as

infrastructure funds, but problems with high fees and extensive leverage mean that these have become less popular since the financial crisis. Interesting vehicles to assist pension funds to invest in the infrastructure sector have been developed in some Latin American countries (such as Chile via infrastructure bonds with insurance guarantees, in Mexico via structured products and in Peru via a collective trust structure and in Brazil via a joint-owed infrastructure company.

3.Regulatory barriers; the move to market-consistent valuations and risk-based solvency standards is indirectly affecting the ability of pension funds and insurers to invest in infrastructure and other alternative asset classes. Specifically, when discount rates are based on market interest rates, there is a strong incentive to use bonds and interest rate hedging instruments to reduce volatility in solvency levels, as has been observed in the insurance sector.

4.Lack of objective, high equality data on infrastructure and a clear and agreed benchmark, making it difficult to assess the risk in these investments to understand correlations with other assets. This makes it difficult to assess the risks of these investments and to understand correlations with the investment returns of other assets. Without such information investors are reluctant to make such allocations.

CONCLUSIONS:

The disruption to long term finance patterns is due to a mix of underlying problems which are in part a consequence of recent developments following the financial crisis and in part due to some more structural problems and longer term trends. This note has first highlighted the disruptions that can be created by the business models of banks, which moved towards more vulnerable structure involving innovative products in derivatives and securities during the run up to the crisis. The sharp rise in leverage and counterparty risk resulting from these developments has led to deleveraging, increased economic uncertainty and an increase in the cost of capital. It will be very important to analyses how to develop policies with respect to suitable bank business models in order to foster an environment more conducive to infrastructure and SME lending, and to foster a more stable environment that will lower the cost of capital, which is so critical in longer term investment funding and decision-making. It is not helpful to foster an environment that once more favors debt over equity. Further analysis is also needed to elucidate the role of different players in stock markets to attract growth companies and new ventures. Institutional investors, such as pension funds, insurers and sovereign wealth funds due to the longer-term

nature of their liabilities, represent a potentially major source of long-term financing for illiquid assets such as infrastructure. Over the last decade, institutional investors have been looking for new sources of long-term, inflation protected returns. Asset allocation trends observed over the last years show a gradual globalization of portfolios with an increased interest in Ems and diversification in new asset classes.

Result & Discussion :

A key issue in the inclusion of environmental issues is the significance of environmental issues-while potentially of some relevance, many environmental issues are of insufficient importance to be a priority, particularly in view of other concerns and practical difficulties. Improving information flows would be and effective way of making it easier for financial institutions to incorporate environmental considerations. There is still potential to reinforce the link between environmental performance and financial performance, notably through the use of economic instruments such as environmental taxes.

Acknowledgement :

1. Through standardization and improvement of information currently being collected and made available environmental regulators
2. As part of its involvement in consumer investment protection, requiring financial institutions to ask investors if they are concerned about how their money is invested environmentally or ethically
3. Developing, as part of its eco-labeling scheme, a label for environmentally responsible investments. The Commission should encourage the development of environmental management at financial institutions, through;
4. Supporting information dissemination on best practice for financial institutions
5. By investigating the potential role for public sector investment banks to take the lead in encouraging private sector finance to support the sector
6. By improving the quality of information on the Commission's environmental support activities, and using financial institutions to disseminate it more widely

Taken together these policy actions could help actively involve financial institutions in achieving sustainable development and could be a powerful tool in achieving the objectives.

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CHANGING CONCEPT OF CONTRACT-RECENT PROBLEMS AND ISSUES

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Abstract-:

Man's contract making activities increase with the increasing trade, commerce and industry. In a way of living in a modern society would be impossible if the law did not recognize this contract making power of a person. This prompted Roscoe Pound to make his celebrated observation: "Wealth, in a commercial age, is made up largely of promises." In this sense India is also a "Promissory" Society. The conferment and protection by the law of this contract making a power of persons gives them a considerable leeway to strike best bargain for the contract making persons. In a way they are permitted to regulate and define their relations in a best possible manner they choose. However, the contours of contractual relations in a feudal, colonial and capitalist society of pre-independence India cannot necessarily be the same in an independent and developing Indian society. Whatever may be the nature of a given society, the contractual relations, as are obtained in that society, are governed by certain principles which are more or less of a general and basic nature. In India these general principles are enacted in the form of the Indian Contract Act 1872. The importance of law as an enabling tool for drafting a clear contract to facilitate a smooth transactional relationship between corporate and farmers cannot be underestimated .Over the past few decades, and in particular in the past twenty years, there have been major changes that necessitate a novel approach to study of the field of contract law. The law and regulations governing business and contract law is very complex and now affect all kind industries and every type of commercial agreement; from entering into a contract, to validity of purchase condition. As far as India is concerned, traditionally, the Indian Contract Act, 1872, is still the governing, foundational law in terms of regulation of all forms of contract, whether the making and breaking of contracts and its legal consequences within the national jurisdiction. Every man in his day-to-day life from dawn to dusk makes a variety of contracts.

KEYWORDS- Contractual Law, Legislation, National Jurisdiction, Legal Problems, Company Law

INTRODUCTION

Law is all about concepts and principles. A thorough and complete grasp of the ideas and principles is the foundation stone of any study. Discovering concepts and principles ourselves through exploration and engagement gives a better understanding rather than being a passive recipient of information. The present research is on the topic Changing Concept of Contract-Recent Problems and Issues and the issues are to a very large extent the creation of the courts and the legislature plays a relatively small part in their development. The principles of contract law are not arbitrary, creation of the common law judges. There was a basis for them.

This was in the prevailing notions of reason and justice in everyday practices. My thesis covers nature of Indian contract Act, 1872, kinds of contract, essential elements of a valid contract in detail. My thesis has sought to highlight on new terms- in contract E-Contract, relevant provisions of IT, Act-2000, Escrow agreements, Outsourcing contracts, Joint venture agreements, Contract farming etc. Similarly, the constituents of contract law-agreement, consideration, consent, performance, breaches and damages-are not unrelated to each other. As they are all about the same phenomenon, theses can never be disparate; the principle and themes are conceptually tied together to constitute the field of contract law. The present study is comprising thousands of cases from the British, American and Indian courts. Some cases, at length, explore and puzzle with the principles and concepts. The present study covers a Comparative study of U.K., U.S.A. and Indian Contract law. The present research incorporates all the relevant pronouncemements of the Privy Council, Supreme Court and the High Courts from 1872-2012.

CONTRACT

Changing Concept of Contract-Recent Problems and Issues, covers the present contract act and the new concepts in contract law which came in contract after1991.The main object of the contract is to enforce the contract between the parties. This Act is based mainly on English Common law consisting of judicial precedents[1]. The Act is not exhaustive as it does not deal with all the branches of the law of contract. There are separate Acts which deal with contracts relating to negotiable instruments, transfer property, sale of goods, partnership, insurance, etc. Before 1930[2], the Act also contained provisions relating to contracts of sale of goods[3] and partnership. Now contract Act, 1872 does not affect any usage or custom of trade[4] (not inconsistent with the provisions of the Act). A minor amendment in section 28 of the Act was made by the Indian Contract (Amendment Act, 1996. The general principles of the law of contract are laid down under section 1-75[5]. Of[6] the Act. The Indian contract act is largely based on the principles of English law. Even at present, where a case is not covered within the particular provisions of Indian Contract Act nor any other law in force in India the court must

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[1] mba-notebook.blogspot.com assessed on 31.10.2013
[2] www.shareyouressays.com assessed on 31.04.2012
[3] www.shareyouressays.com assessed on 31.05.2013
[4] www.lawyersnjurists.com assessed on 31.01.2012
[5] 210.212.95.124 assessed on 31.12.2013
[6] 210.212.95.124 assessed on 31.11.2013

follow the principles of English Common Law which are not inconsistent with the Indian conditions.

CHANGING CONCEPT OF CONTRACT

Concept of Contract is changing since 1991 due to public private -partnership, industrialization, globalization etc. Many new terms have come in contract act for example e-contract, I.T. act escrow agreement joint venture agreement, contract farming, outsourcing contracts etc. The present research has sought to highlight on the all above mentioned new contract terms. In earlier society exchange and barter prevailed and these were the foundations of modern contract law. By the third quarter of the nineteenth century, the world had experienced accelerating industrialization, generated by scientific innovation, economic entrepreneurship and increasing access to both labor and capital. This gave rise to an unprecedented boom in trade. This boom has been accompanied by a similar massive development of those areas of law that were designed to regulate business relationships i.e. Contract, commercial and company law. At the time when the classical model emerged, it was more accurate than it is today to refer to a general law of contracts. There were special rules for certain types of contracts but the tendencies to develop special rules has increased with the time. In broad terms, the general principles of contract law today, called 'residue' are those rules that remain untouched by, or are merely amended by statutes or judge made law.[7] In all contract law our problem is to determine what facts will operate to create legal duties and other legal relations. The study has found at the outset that bare words of promise do not so operate. The problem then becomes determining what facts must accompany promissory words in order to create a legal duty.

One must know what these facts are in order that one can properly predict the enforcement of reparation, either specific or compensatory, in case of non performance. Consumers are looking for a sufficient cause for the legal enforcement of a promise. This problem was found in all system of law. With us it is called the problem of consideration[8].

The courts will generally enforce consequences logically implied in the language of contracts, wills, statutes, and other legal documents and transactions, the point now to be noticed is that the legal doctrine of implied terms goes much farther than the judges are accustomed to read into

[7] Akhileshwar Pathak, Law of business contract (2010) Oxford Publication id at p.11
[8] www.archive.org .assessedon 13.09.2013

and many terms are not logically implied in them. The classical model was heavily influenced by then prevailing notions which treated contracting parties as economic units assumed to have equal bargaining strength. This idea was called 'freedom of contract'. The premise behind this was that when the parties are allowed to determine the basis on which the exchange goods, services and money and if the suppliers are ready to consumer demand, then in the long run the market will supply consumers with what they want at a price they are willing to pay. It can be seen from this that the notion of 'freedom of contract' is closely associated with a belief in the free market. If there is one thing more than another which public policy requires, it is that men of full age and competent understanding shall have the utmost liberty in contracting, and that their contracts, when entered into freely and voluntarily, shall be held sacred and shall be enforced by Courts of Justice[9]. However, much of the history of contract law since these words were spoken by Sir George Jessel in 1875, concerns the decline of the idea of 'freedom of contract'. This is the result of social change. Almost 130 years on, it is no longer the individual entrepreneur but the government which is primarily concerned with the allocation of resources[10]. In India, *Andhra Sugars Ltd* v. *State of Andhra Pradesh* is a case on this point. In this case, a cane grower had the freedom to offer came to the factory of his area or not, but if he made an offer, the factory was bound under an act to accept. The Court pointed out that in such a case the consent, though not compulsory, is not caused by undue influence, fraud or misrepresentation or mistake[11]. The compulsion of law is not coercion. Another notion that has evolved at par with the 'market-individualism' as discussed earlier, is the theory of 'Consumer Welfarism.' The 'Consumer Welfarism' theory brings fairness and reasonableness in contract. It does not start with the 'market-individualistic' premise that all contracts should be minimally regulated. Rather it pre-supposes that consumer contracts are to be closely regulated, and that all commercial contracts are to be subject to more regulations than 'market-individualism' would allow[12]. Theories underpinning the law of contracts are in a state of flux. Criticisms of the Classical model focus on its emphasis on procedural justice at the expense of substantive justice, its privileging of rules over understanding and context, and its inability to reflect the day to day world of contracts. Welfare interventions on behalf of consumers have mitigated the more extreme injustices of a model based on the assumption that the parties to a contract exercise free will. These

[9] Allafrica.com assessed on 14.08.2014
[10] ibid
[11] Icmail.in assessed on 14.08.2014
[12] Nwikipedia.org assessed on 14.08.2014

interventions remain exceptions to the general rules rather than a general platform on which discussions could be based. Modern contract law has developed itself into a specialized branch of law. Contract law is governing, foundational law in terms of regulation of all forms of contract; one must appreciate that business contracts have grown beyond the proposition of the century-old Contract Act. When contracts cross national boundaries, the national legal regime of any single country becomes inadequate to grapple with the situation. When the parties to the contract are located in different countries, at least two systems of law impinge upon the transaction and the rules of Private International Law come into play. The best way to ensure the application of a particular legal system to international contracts is to choose a particular law to govern this contract. This law is called the "Proper Law of the Contract[13]." The courts have held that Proper Law is the law which the parties have expressly or impliedly chosen, or which is imputed to them by reason of its closest and most real connection." Modern contract is largely involved in multinational, or transnational, jurisdiction, with International Conventions such as Convention on International Sale of Goods (CISG) or the clauses of International Arbitration governing formation of contracts in India. Issues of international taxation and multinational contractual jurisdiction are also areas which govern modern forms of contract. Largely, these complex issues are seen in e-contract which is a multinational personality in the chain of production, distribution, and consumerism. Further, one must seek the modern developments of contracts which have changed the meaning and facets of traditional contractual terms. Minors can enter into contracts in the field of entertainment and sports. No longer are the courts sticking to the notion that a contract with a minor is void ab initio. But freedom of contract rules dominates the decision of the courts in such cases. An attempt has been made to state the positions taken by judges on the various forms of contracts in a comparative analysis of decisions in India, the US, and the UK[14].

PROBLEMS AND ISSUES The Indian Contract Act, 1872, is a legislation governing the contractual relationship between two or more parties - individuals, companies, governments. It deals with all aspects of contracts, such as formation, performance, enforceability of contracts, indemnities and guarantees, bailment and pledge and agency, among others. Although one of the oldest laws in India, legal experts note that The Indian Contract Act's relevance has grown manifold in the current business environment with significant increase in the number of contracts being entered into between various parties, and the resultant disputes.

[13] Ibid
[14] www.ausib.org assessed on 14.06.2014

Over the last one year or so there has been an effort to step up corporate governance across boards through new company law provisions, and updating Securities and Exchange Board of India's (Sebi's) listing agreement for companies. Many legal experts feel that the time has come to take a hard look at The Indian Contract Act to bring it in sync with the changing business environment. "Good corporate governance demands well-defined and executed contracts, where the Indian Contract Act plays a crucial role," said Ramesh Vaidyanathan, managing partner, Advaya Legal. Most legal experts say The Indian Contract Act is a relevant and comprehensive piece of legislation. The concepts under the contract law are based on the contract law of the United Kingdom. However, the Act contains certain provisions which are different.

Different strokes

Section 73 of The Indian Contract Act provides for compensation for loss or damage caused by breach of contract, naturally arising in the usual course of things from such breach. However, remote and indirect loss or damage sustained by reason of the breach is not provided under the contract law. The Indian Contract Act provides for liquidated damages and other penalties to the party that suffers from breach of a contract. But contract laws of many countries restrict total compensation to the amount of liquidated damages. Any contract that restrains one from exercising lawful profession, trade or business of any kind, is termed void as per Indian contract law. Also, it does not provide for apportionment of losses in contracts which are void. That is not the case in laws of many other countries. Under The Indian Contract Act, a contract without consideration is void subject to certain exceptions provided in Section 25 of the Act. However, the English law recognises contracts without consideration in some cases. The contract law in the United States, too, have evolved from the English common law. However, there is no federal contract law in the United States and each state has its own contract law. Continental Europe - Germany and France - follow a different system of law known as the civil law system, said Aakanksha Joshi, associate partner, Economic Laws Practice. "Their contract law is highly detailed and exhaustive," she added. Many legal experts feel that there are three primary areas where Indian contract laws need to get an update.

Recognise non-compete restrictions

According to Lalit Kumar, partner, J Sagar Associates, post-termination of a contract any non-compete clause in the contract is void as they are treated as "restraint of trade" under Section 27

of the Indian Contract Act, 1872. Legal experts note that provisions like non-compete are ubiquitous in modern international contracts, especially if parties have similar bargaining powers. "Indian Contract Act should expressly permit such contracts," said Vaidyanathan. Further parties should be free to enter into contracts which also contain the dispute settlement mechanism, and such contracts should not be treated as "contracts in restraint of legal proceedings" under Section 28, say many legal experts.

Provisions for digital contracts

Given the growing number of transactions undertaken online, Indian contract law needs to be tweaked for concepts relating to offer and acceptance in digital contracts. Legal experts, like Lalit Kumar of J Sagar Associates, point out that although e-contracts are legal in terms of the Information Technology Act but there is some insecurity while dealing and executing e-contracts online. "There is a need for a specific chapter to govern all electronic contracts. Presently, the general principles of Contract Act is sought to be applied to electronic contracts," says Krishnayan Sen, Partner, VERUS Advocates. While giving more clarity to rules regarding formation of e-contracts, the Act needs to provide for questions around jurisdiction in e-contracts, rights and liabilities of parties, and cases of unilateral mistakes by one party, he adds.

According to Joshi of Economic Laws Practice clarity is needed for acceptance of the terms and conditions of websites - whether logging on to a website automatically means that the user has accepted the terms and conditions and hence is bound by them.

Regulate unfair terms of a contract

Indian contract laws do not have a law regulating unfair terms of a contract, points out Sen of VERUS Advocates. "It is necessary to evolve general principles regulating unfairness in contracts. This will have wide ramifications in a range of contracts including lending agreements, builder-developer agreements, debt instruments, landlord-tenancy agreements, government contracts, arbitration agreements, among others," he says.
Legal experts say most developed jurisdictions have evolved ways to deal with unfairness in contracts, and recognise the possibility of 'procedural' and 'substantive' unfairness. "Courts should also be vested with the power to raise an issue of unfairness even if the parties have not

raised such a plea," says Sen. Many in legal fraternity point out that even the Law Commission has recommended that a separate legislation should be enacted to grant protection to parties from such unfair terms. Most legal experts agree that The Indian Contract Act is well-drafted legislation, but certain amendments would help it to keep it up to date with latest global business practices. This can only give more confidence to foreign parties wishing to do business in India[15]. Corporate governance involves a set of relationships amongst the company's management, its board of directors, its shareholders, its auditors and other stakeholders. These relationships, which involve various rules and incentives, provide the structure through which the objectives of the company are set, and the means of attaining these objectives as well as monitoring performance are determined. Thus, the key aspects of good corporate governance include transparency of corporate structures and operations, the accountability of managers and the boards to shareholders; and corporate responsibility towards stakeholders. While corporate governance essentially lays down the framework for creating long term trust between companies and the external providers of capital, it would be wrong to think that the importance of corporate governance lies solely in better access of finance. Companies around the world are realizing that better corporate governance adds considerable value to their operational performance:

- It improves strategic thinking at the top by inducting independent directors who bring a wealth of experience, and a host of new ideas
- It rationalizes the management and monitoring of risk that a firm faces globally.
- It limits the liability of top management and directors, by carefully articulating the decision making process

Good corporate governance system also gives due recognition to the Stakeholder's theory. The main intention of the stakeholder's concept as theory is to affirm and show that the company together with its executive board is responsible not only for shareholders but also for individuals or groups that have a stake in the actions and decisions of such organization[1617].

CONCLUSION

[15] http://www.business-standard.com/article/opinion/does-the-indian-contract-act-need-a-re-look-115011100799_1.html
[16] http://www.lawctopus.com/academike/corporate-governance-in-india/
[17] http://www.nfcgindia.org/library/cgitp.pdf

At law, a **contract** is a binding legal agreement voluntarily entered into by two or more parties. Each contractual party must be a "competent person" having legal capacity. The parties may be natural persons ("individuals") or juristic persons ("corporations"). An agreement is formed when an "offer" is accepted[18]. According to Lalit Kumar, partner, J Sagar Associates, post-termination of a contract any non-compete clause in the contract is void as they are treated as "restraint of trade" under Section 27 of the Indian Contract Act, 1872. Legal experts note that provisions like non-compete are ubiquitous in modern international contracts, especially if parties have similar bargaining powers. "Indian Contract Act should expressly permit such contracts," said Vaidyanathan. Further parties should be free to enter into contracts which also contain the dispute settlement mechanism, and such contracts should not be treated as "contracts in restraint of legal proceedings" under Section 28, say many legal experts[19].

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Emerging Trends In Insurance – A Study In Indian Life Insurance Industry

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INTRODUCTION

Insurance is one of the demanding financial products in India. Its basic motto is to protect the family of any uncertainty in life. So it is long term investment and need knowledge about that. Indian life insurance is too old. It is there from British Period and after nationalization; it has come fully under Government.

In the post liberalization era, insurance has attracted any private players from different parts of the country to start business India. India as a country has potential for growth of this business. With the upcoming of regulator in the year 2000, the business in India became more streamlined. Large players along with customer choice results severe competition Life Insurance Corporation of India in one end and ICICI Prudential life insurance from private sector on the other end has taken maximum market share from both category. Product innovation, profitable growth, multi channel distribution and ethical practices in business are few factors to be considered. Regulation from Government and research in this sector many times a challenge for the existing players. In this situation, a brief study of the above sector is required.

STATEMENT OF THE PROBLEM

The study is indicated briefly to analyze the recent trends of the life insurance and its impact to the entire insurance Industry

LITERATURE REVIEW

Bengal Chamber of commerce and KPMG (2013) addressed the present context of insurance. The external environment changed the entire industry. Profitability, growth and risks were to be considered with respect to shareholder's view. FICCI and BCG (2013) discussed many issues with the industry. Mindset of the people towards insure is an important part. Distribution, Cost and digitalization are some of the key areas to be thought of. Jain (2011) from Capegimini explored that life insurance industry need support in the area of distribution, product diversity and regulation. At the same time it was felt that outsourcing function should be from the broader perspective rather than cost. CII & E &Y (2012) searched that insurance needs talent to grow in the competitive market scenario.

Objective of the study

1. To study the present life insurance scenario and their growth drivers in India
2. To study the present trends in life insurance sector
3. To suggest feasible measures for improvement in the sector

RESEARCH METHODOLOGY

Exploratory research methodology is used here to analyze the data. Data was collected from multiple sources such as books, journals to understand the Life insurance industry. In this paper, we have referred previous research articles. Apart from this, we have visited different websites and professional magazines. Some more data was collected through personal and telephonic interviews and discussion with leading corporate people. So it is purely based on available secondary data.

Understanding Insurance

Insurance is a financial products and quite popular in India. It is simply a contract between insurer and insured. The insurer is the company and the insured are the customers. It compensates our financial loss due to any uncertain death or other situations. This long term products need a careful planning in both design and implementation. Insurance in broad is divided into two; life and general insurance. Later on health insurance has come out of general insurance. The products of insurance are normally termed as plans or policies. The money we charge from customers is known as premiums and the duration is referred as term of plan. The products are various types and in nature starting from term insurance to unit linked plans.

Indian Life insurance at a glance

Life insurance is an important financial product like banking, pension and others. Life insurance provides protection to life and non-life areas. It is one of the fastest growing industries in India. As per Swiss Re report in 2011, India's ranking in world insurance market was 15th which was lowered than previous year and share of the market was 1.58% of the world market share. At present, there are 23 players in life insurance sector in private and 1 is in Public a enterprise which is LIC. Life Insurance Corporation is the market leader. In 2011, its market share was lowered to 69.78%. Among private players, ICICI Prudential life insurance stood first.

The industry gained momentum after the regulator, insurance regulatory and development authority (IRDA) came into existence. They made standard rule for all the players. Apart from Life insurance Corporation, many private players have shown interest to start business in India. At present we have 23 players leaving the PSU major, LIC.

The growth if Indian life insurance sector is divided into two main periods. One from 2001 to 2010 and other from 2012 to onwards. The first 10 years was high growth with compound annual growth rate (CAGR) of approximately 3.1% I new business premium. Most of the players were in good condition due to the emergence of unit linked insurance plans. From 2010 onwards, the compound annual growth rate was around 2%. Stiff competition was one of the reasons for the stagnant growth in the year of 2012. Table-1 shows the companies in detail

Table 1. List of Life Insurance Companies

Sr. No.	Name of Life Insurance company	Head Office
1	AEGON Religare Life Insurance Company Ltd.	Mumbai
2	Aviva Life Insurance Co. India Ltd.	Gurgaon
3	Bharti AXA Life Insurance Company Ltd.	Mumbai
4	Bajaj Allianz Life Insurance Company Limited	Pune
5	Birla Sun Life Insurance Co. Ltd.	Mumbai
6	Canara HSBC Oriental Bank of Commerce Life Insurance Company Limited	Gurgaon
7	DHFL Pramerica Life Insurance Company Limited.	Gurgaon
8	Future Generali India Life Insurance Co. Ltd.	Mumbai
9	HDFC Life	Mumbai
10	ICICI Prudential Life Insurance Co. Ltd.	Mumbai
11	IDBI Federal Life Insurance Co. Ltd.	Mumbai
12	India First Life Insurance Company Limited.	Mumbai
13	ING Vysya Life Insurance Co. Ltd	Bengaluru
14	Kotak Mahindra Old Mutual Life Insurance Limited	Mumbai
15	Life Insurance Corporation of India	Mumbai
16	Max Life Insurance company Ltd.	Gurgaon
17	PNB MetLife India Insurance Company Limited	Bengaluru
18	Reliance Life Insurance Company Limited	Mumbai
19	Sahara India Life Insurance Co, Ltd.	Lucknow
20	SBI Life Insurance Co. Ltd.	Mumbai
21	Shriram Life Insurance Co. Ltd.	Hyderabad
22	Star Union Dai-ichi Life Insurance Company Limited	Mumbai
23	Tata AIA Life Insurance Company Ltd.	Mumbai
24	Edelweiss Tokio Life Insurance Co. Ltd.	Mumbai

Source: IRDA website (www.irda.gov.in)

Growth Drivers of Life Insurance Industry

From the literature review and market experience, it is clear that many factors are responsible for the robust growth of this sector. The major are as follows

Growing Economy: The economy of India is growing significantly. The second populous country has witnessed a phenomenal growth in major financial services. Various government schemes and programs also helped a lot. The purchasing power of people has increased. Also increase in income has augmented the disposal income among people. Good saving and awareness among various sources of getting the products have compelled the people to go for specialization rather than generalization. It is estimated that by 2026, the working population which ranges n the age group of 25 to 40 will reach approximately 795.5 million.

Rural as a major thrust: More than 70% of population lives in rural area. At the same time their consumption pattern, choice and preference has changed. Technology and internet has given ample scope for rural people towards adopting new ideas. All these forces provided a larger platform to multinational players to focus more on rural.

After 2005, the regulator had come with micro insurance specially designed for rural people with low premium and high coverage. The pattern of distribution and pricing is also suitable for rural people with micro insurance. In order to foster growth, Govt. also made mandatory to do certain percentage of policies every year from rural area for the insurance companies. All these steps provide new avenues for the players to think growth more in rural area.

Development of other insurance: Apart from life insurance, there is strong growth in auto sector from 2003 to 2010. The no of passenger and commercial vehicles has increased incrementally. As a result, the motor insurance has become more popular among people.

Health insurance has created a separate portfolio in the last few years. People have realized the importance of this due to rise in the healthcare cost. Introduction of Technology in medical science and demand for good service is the main cause for higher medical cost. Awareness about the health due to various schemes and non-government intervention has enlarged the vision of the people about health care. Rastriya Swathya Bima yojana (RSBY) of 2007 is one of the mile stone in this area where people below poverty line are able to get minimum health service.

FINDINGS

Trends in Insurance

Hybrid distribution channel: In the life insurance industry, the prominent distribution was agency. Around 90 % of businesses were coming from them. The high cost and low persistency in policy has thought of going to other channels known as alternate channels. Recently the contribution from alternate channels is increasing. In this context, Bancassuarnce increased and the no of banks as insurance partner has gone up. Both Public sector banks and Private Banks have come up with their insurance partners.

Broking and corporate agency has their own way of doing the business. Individual and institution as corporate agents has helped agency to increase the revenue. At the same time, we have also taken the help of rural development organization such as NGOs, Trust and SHG members to cover the rural area. Finding the right distribution channel for the customer is a trouble area. All these have demanded a high skill in management.

Difficulty in designing Marketing Mix: Marketing mix refers the combination of all P"s to make the market attractive. Innovation in product which invited many unit linked policies was the centre of attraction for all. Low premium due to large no of players sometimes were uncomfortable for all. The entire banking industry is advanced in the communication strategy. This has compelled insurance players to practice innovative communication strategy including advertisement. So is not only product, but a balanced marketing mix is required for the industry with modern trend.

Regulatory trend: The Indian regulator has introduced rules and regulation from to time to control the entire industry. Recent changes in the cap on ULIP charges have created havoc and the contribution of ULIP to entire policy has decreased. In order to provide better service, the

regulator has come with few changes. Servicing of orphan policy, more focus on long term are few examples where the insurer are finding difficult. Standardization of the proposal form is another step by regulator. So the insurers are facing many challenges in the area of product, price, distribution and taxation.

On line policy: Internet and technology has helped a lot to insurer. Now policy procuring through on line is cheaper than buying the same plan from agent. The major problem is not getting the support from the agent for that policy, if there is a claim or maturity. The person has to keep direct contact with the company.

Claim Management: From 2010, the no of advisors have decreased in the industry. The no of agents declined 29% from March 2010 to March 2013. Also it is expected that more agents will leave the industry. Under this situation, Claim management will be tougher for the companies. As people buy insurance because of the face value of agents, assistance of them is highly essential for good business

Customer Servicing: From the year 2013, it is very clear that traditional plans have gained more weightage over ULIP. As traditional plans are long term products, insurer need to focus more on this. Customer retention and servicing is the key to remain in business. Even if in new pension plan, the capital protection features demands more policy servicing. Here investment and servicing are important for the companies. Above all, Policy administration is the most difficulty area to provide customer servicing.

FDI and growth: Foreign direct investment and insurance industry is more debated and controversial one, The proposal to hike it from 26% to 49 is long term pending with government. Insurer are finding difficult to continue investing in business. Additional fund is highly required for this capital intensive industry.

RECOMMENDATION

From the above discussion on findings, we came across few novel ideas. Life insurance in India is in growing stage and to maintain it, the following five points" are to be considered

- Corporate must go to the basics of service marketing such as "under promise and over delivery"
- Customization of offerings, mainly in product and distribution
- "Pockets of service" is to be done for quicker service and other operation
- Advanced knowledge in the insurance is to be imparted to the employees in Insurance industry
- "Digitalization and Relationship" is to be kept in policy marketing

CONCLUSION

Life insurance business in India needs a special care as compared to other business. Both theory and practice to be integrated to provide the best services to the policy holders. This industry is going to face more challenges due to change in economy and employment. More no of players around the world have planned to enter into India looking to the potential available here.

Probably understanding the customer expectation and attitude for this product is the important. There is time to re-engineer the business model.

FUTURE STUDY

In this paper, the trend is more of general. It is important to study segment wise, may be rural & urban, unit linked and non-unit linked etc. Also the impact on the entire industry needs to be studied in a broader aspect. By and large, this industry requires more in depth research to face the challenges and business sustenance.

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CHANGES IN THE PHOSPHORUS CONTENT DURING LEAF SENESCENCE IN SERICULTURAL CROP *MORUS ALBA* LINN.

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ABSTRACT

An attempt has been made to study the changes in the phosphorus content during leaf senescence in mulberry (*Morus alba* Linn.). The variations in phosphorus status in young, mature and senescent leaves of the mulberry cultivars VIZ. M5 (K2), V1 and S36 are recorded in figure. It is clear from the figure that, the young leaves of all the three cultivars have very high Phosphorus content. In all the three mulberry cultivars there is marked decline in the phosphorus content in the senescent leaves. Such decrease is quite significant in cultivar S36. Thus, presence of Phosphorus content in the leaves may affects silkworms, as young and mature leaves of mulberry are fed to silkworm.

Keywords – Phosphorus, *Morus alba* Linn.

INTRODUCTION-

Mulberry *(Morus alba* Linn.) leaves are used as food while rearing monophagous silkworm, *Bombyx mori* L. (Ullal and Narasimhanna,1981). Health and growth of the larvae, cacoon quality and raw silk quality are influenced by quality of leaf. Since, the physiological status of mulberry leaf is important in determining the nutritional quality; the age of leaf may influence silkworm feeding, Cacoon production depends mainly on nutrient composition of mulberry leaves (Krishnaswami *et al*., 1971; Bhuyian, 1981). Many aspects like health and growth of the larvae, cacoon quality and raw silk quality are also influenced by quality of leaf. In addition to involving verities, different practices have been worked out to raise leaf production including irrigation, pruning and training types, application of fertilizers, etc. (Koul and Bhagat, 1991; Singh and Koul, 1997; Pandit *et al.,* 1999). Ganga (2003) suggested that, over mature and yellow leaves with low protein content should be discarded to other nutritious feed to the worms. During present study nutritional constituents of young, mature and senescent leaves from three cultivars of mulberry (viz- M5, V1 and S36) studied has been compared. Hence, In order to have further insight in to the above problem, a fate of various nutritional constituents during leaf senescence in the three cultivars of mulberry (viz.- M5 (K2), V1and S36) has been studied in the present investigation.

MATERIAL AND METHOD-

The phosphorus content was estimated according to the method of Sekine *et al*., (1965). Phosphorus reacts with 'Molybdate Vanadate Reagent' to give yellow coloured complex. By estimating calorimetrically the intensity of the colour developed and by comparing it with the colour intensity of the known standards, phosphorus content was estimated. Two ml of acid

digest was taken in the test tube and to this, equal amount of 2N HNO_3 followed by 1ml of freshly prepared Molybdate Vanadate reagent (A-25 g Ammonium molybdate in 500 ml of distilled water. B - 1.25 g Ammonium vanadate in 500 ml 1 N HNO_3, A and B were mixed at the time of using) were added. Then final volume of solution in each test tube was made to 10 ml with distilled water. The ingredients were mixed well and allowed to react for 20 minutes. After 20 minutes colour intensity was measured at 420 nm using a reaction blank containing no phosphorus.Calibration curve of standard phosphorus was prepared from standard phosphorus solution (0.110 g KH_2PO_4 l^{-1} = 0.025 mg p^{5+} ml^{-1}) taking different concentrations (0.5ml, 1ml, 2ml and 4ml P), other steps being essentially similar to the one described above. With the help of standard curve, amount of phosphorus in the plant material was calculated.

RESULT AND DISSCUSSION-

The variations in phosphorus status in young, mature and senescent leaves of the mulberry cultivars namely M5 (K2), V1 and S36 are recorded in Fig.1. It is clear that, from the figure the young leaves of all the three cultivars have very high P content. In all the three mulberry cultivars there is marked decline in the phosphorus content in the senescent leaves. Such decrease is quite significant in cultivar S36.

In all living organisms whether bacteria, plants or animals, phosphorus is indispensable element, essential for most of the life processes. The significance of these macromolecules in cellular metabolism processes needs no explanation. This element is taken by the plants mainly as $H_2PO_4^-$ and it remains as inorganic phosphate (Pi) or it is esterified through a hydroxyl group to a carbon chain (C-O-P) as a simple phosphate ester (e.g. Sugar phosphate) or attached to another phosphate by the energy rich pyrophosphate bond (P)□(P)(e.g. in ATP). The phosphorus uptake by plant roots is active uptake processes and it is influenced by soil, pH and various environmental factors and metabolic state of the roots. Further, P nutrition of the plants is improved by symbiotic association with mycorrhiza. There is existence of two major phosphate pools in cells of higher plants. In the "metabolic pool", represented by the cytoplasm and including chloroplast and mitochondria, phosphate esters dominate, whereas, in the "non-metabolic pool" or the vacuole, Pi is the dominant fraction. In addition to its role in the non-metabolic pool, Pi is absolutely necessary in the metabolic pool. Pi is either a substrate or an end product in number of enzyme reactions (e.g. ATP→ADP + Pi) and it also controls some key enzymes reactions. Therefore, the differential distribution of Pi is necessary for the regulation of metabolic pathways in the cytoplasm and chloroplasts. Aspects of the phosphate starvation response were reviewed recently by Plaxton and Carswell (1999).They speculated that the decrease in phosphate concentration due to limited Pi supply from the growth medium involves several changes not only in the photosynthetic process but also in glycolysis, respiration, and nitrogen metabolism. In phosphorus deficient plants, low sink strength imposes the primary limitation on photosynthesis (Paul and Foyer, 2001).Phosphorus deficiency leads to a general reduction of most metabolic processes, including cell division and expansion, respiration and photosynthesis (Terry and Ulrich, 1973). According to Rangaswami *et al.,* (1978), phosphorus deficiency in mulberry lead to symptoms such as intraveinal chlorosis of older leaves and the chlorosis spreads throughout the leaf and this is followed by marginal necrosis and defoliation.

Further, the stem becomes slender without fresh growth and the root system becomes stunted (Rangaswami *et al.,* 1978). For the optimal growth of the plants the requirement of the phosphorus is in the range of 0.3 to 0.5% of the plant dry wt during the vegetative stage of growth (Marschner, 1986). Mulberry leaves contain 12.00 – 18.00% total minerals with 0.23 – 0.97% on dry wt. basis (Jayal and Kehar, 1962). Phosphorus content in mulberry leaves is 0.31 – 0.35% as mean value of five cultivars (Shivaprakash *et al.,* 2001). In the present study mulberry varieties such as M% (K2), V1 and S36 shows phosphorus content 0.362% in M5 (K2) variety, 0.306% in V1 variety and 0.960% in S36 variety. These values are in the range of Jayal and Kehar, (1962) and Shivaprakash *et al.,* (2001). Radha *et al.,* (1988) reported that a deficiency in phosphorus affected the uptake of other elements by the mulberry leaves and had an adverse effect on the cocoon and silk characters. Since, the phosphorus content is markedly reduced in senescent mulberry leaves, the deficiency of P besides causing metabolic disturbances within the mulberry leaf, may also become a limiting factor in case of silkworm nutrition. Phosphorus is found to be one of the most mobile elements in the plants. Hence, it's retranslocation from old senescing leaves to young leaves is documented in number of plants (Hill, 1980; Wang and Lin, 1999; Collier and Thibodeau, 1995 and Milla *et al.,* 2005). According to Nooden (1988b), the redistribution of elements begins with release of the minerals from the tissues where they have been invested. Dangl *et al.,* (2000) have indicated that much of the organic phosphorus in the leaves is in the form of nucleic acids, which seem to have a dual function of carrying genetic information and acting as salvageable reserve substances of high molecular mass. These workers further argued that the conditions during senescence are both energetically and enzymatically favourable for release of phosphorus from the organic compounds.

The values presented in the part –'Results and Discussion' represent average of three independent determinations.

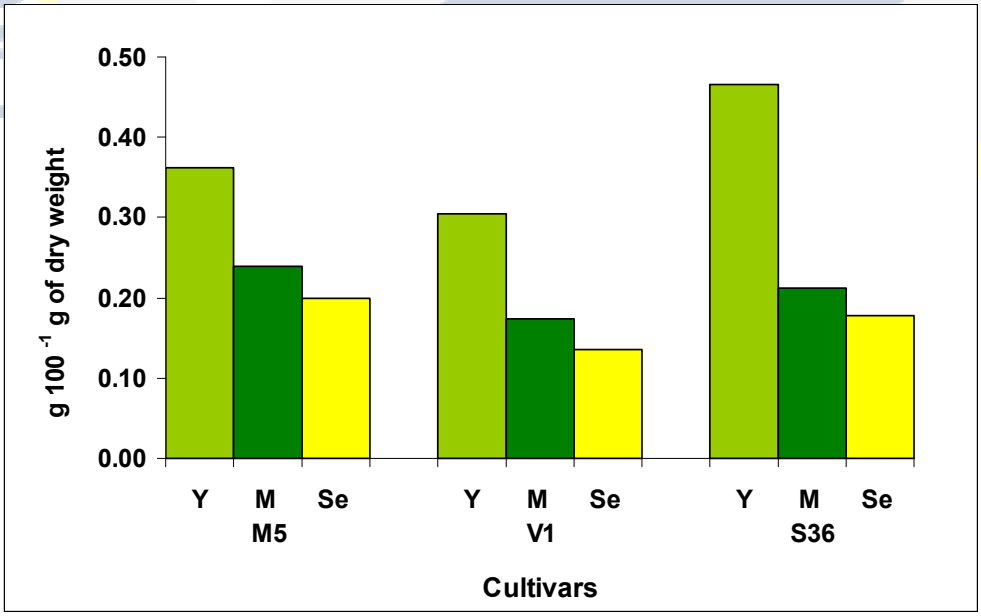

Fig. 1: Changes in the phosphorus content during leaf senescence in sericultural crop *Morus alba* Linn. (Y = Young, M = Mature and Se = Senescent)

CONCLUSION-

Phosphorus is then readily translocated through the vascular system in the form of inorganic phosphate. Similar situation might also be prevailing in senescing mulberry leaves because as compared to young and mature leaves the P content in the senescent leaves is markedly reduced.

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Antioxidant Phenolic High Performance Engineered Woods with Killer MERS From Brewers' spent grain

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Abstract

Brewer's spent grain (BSG) is the most abundant by-product generated from the beer-brewing process, representing approximately 85% of the total by-products obtained. Antioxidant phenolic compounds extracted from BSG could be used as a natural and inexpensive alternative to synthetic antioxidants. A cellulose-rich pulp (904 g kg−1) with low hemicellulose and extractive contents (79 and 34 g kg−1 respectively) was obtained by soda pulping of acid-pre-treated BSG. Subsequently, the pulp was bleached by a totally chlorine-free sequence carried out in three stages, using 5% (v/v) hydrogen peroxide in the first two stages and 0.25 mol L−1 NaOH solution in the last stage. Using this procedure, a bleached pulp can be presenting a kappa number of 11.21, viscosity of 3.12 cP, brightness of 71.3% for the Antioxidant Phenolic High Performance Engineered woods with Killer MERS From Brewers' spent grain. Acetone : water mixtures, especially at 60% v/v, were highly efficient to extract these Antioxidant compounds. The antioxidant capacity of the produced extract was strongly correlated to the content of flavonoids. The total phenolic contents (TPC) and total anthocyanin contents (ACC) of the after TiO2 Coating(R=0.99) is higher than Before Coating (0.97) are higher than the berry extracts (Using Acetone). Electron from Photocatalyst (Tio2) can stimulate more efficiency the antioxidant activity with the phenolic from Brewers' spent grain. The electronic (e-) on the valence band can be excited transition to the conduction band and brought a corresponding hole (h +) on the valence band, generating active oxygen and hydroxyl radical with high oxidation which can make harmful organics, pollutants odor, bacteria virus , Escherichia coli and Volatile Organic Compounds.

Keywords:

High Performance Engineered woods, Antioxidant, Photocatalyst

1. Introduction

Beer is the fifth most consumed beverage in the world apart from tea, carbonates, milk and coffee. In the manufacture of beer, various residues and by-products are generated. The most common ones are spent grains, spent hops and surplus yeast, which are generated from the main raw materials. Spent grains are the by-products of mashing process; which is one of the initial operations in brewery in order to solubilize the malt and cereal grains to ensure adequate extraction of the wort (water with extracted matter). Following different separation strategies, the amount of brewers' spent grain (BSG) generated could be about 85% of the total by-products (Tang et al.,2009), which accounts for 30 to 60% of the biochemical oxygen demand (BOD) and suspended solids generated by a typical brewery. BSG is a readily available, high volume low cost by-product of brewing and is a potentially valuable resource for industrial exploitation.

2. Antioxidant Phenolic High Performance Engineered Woods with Killer MERS From Brewers' spent grain

Engineered wood, also called composite wood, man-made wood, or manufactured board; includes a range of derivative wood products which are manufactured by binding or fixing the strands, particles, fibers, or veneers or boards of wood, together with adhesives, or other methods

of fixation to form composite materials. Hardboard (not to be confused with hardwood), also called high-density fiberboard (HDF), is a type of fiberboard, which is an engineered wood product. It is similar to particle board and medium-density fiberboard, but is denser and much stronger and harder because it is made out of exploded wood fibers that have been highly compressed. Consequently, the density of hardboard is 31 lbs or more per cubic foot (500 kg/m³) and is usually about 50-65 lbs per cubic foot (800–1040 kg/m³). It differs from particle board in that the bonding of the wood fibers requires no additional materials, although resin is often added. The hardboard variety is made without resin. The HDF version is made with resin. Unlike particle board, it will not split or crack. This research aims to study the application of Brewer's spent grain (BSG) as wood-substituted biocomposites in high density fiberboard. The fiber : non-urea formaldehyde glue: Concentrated latex glue with polymeric diphenymethane diisocyanate type (pMDI) ratio is equal to 1: 0.13: 0.003. The fibers are taken from Brewer's spent grain (BSG) that 7 ratios are used to all of fiber mixing. The fiberboard production use 130°C of temperature with 20 – 50 kg/sq.cm of compressive pressure with 8 minutes per piece of rate. Their fiberboards have 603 – 856 kg/m of density that was tested follow the TIS 876-2547 standard. Resulting, it can pass the standard in physical properties and mechanical properties. Moreover, their fiberboards have good thermal insulation.

This project focuses on thermal-modification technology to enhance the utility of engineered wood products in order to improve dimensional stability and resistance to biodegradation and weathering. Service life will also be extended, while at the same time reducing environmental impacts. This project will advance thermal-modification technology toward the development of advanced, high-performing engineered wood products. Thermally-modified wood is currently used in a limited set of applications, including solid wood flooring, external cladding, and decking products.

Polycasonal as the filler of the thermal stability found in the liquor Precipated ash which is a waste product from the manufacture of liquor has 20-36 carbon atoms and can be used to extract crude waxes from a dry powder ashes. The obtained pure wax extracted from the fatty materials has the flexible polymer additive as the quality protection and flexibility in The bonds within the molecules with high strength makes high density wood composite. The filler added thermal stability in the advance composite wood materials for Thermally-modified wood at the heat up to 60 degrees Celsius, the chemical composition and physical characteristics of the preciapted ash by the synthesis of zeolites with alkaline ash. The study optimal conditions for the synthesis of zeolite powder and ashes from the reaction temperature to 80 degrees Celsius concentration Spent alkaline 3.0 M and 2.5 M, respectively. The 4 days duration of the reaction which will provide the ability to exchange calcium ions at 473.74 cmol / kg and 286.68 cmol / kg.

3. Effect Of Composition On TRIBOLOGICAL Wood Composite Properties

Effect of Polycasonal and Zeolite extracted from Liquor Precipated ash on physical Properties of Tribology Wood Composite

The development of the advanced material properties is a lightweight material, Durable, resistant to high level heat, flexibility, toughness Resistant to corrosion and abrasion. The smart materials that can adapt to extreme environments are non-polluting and can replace traditional materials that cause harm environmental. Advanced composite materials commonly used in lightweight construction but focus on high level heat resistance property components. Due to its ability to high level heat resistance property, but due to high production costs, making it unpopular in

many spacecraft component and other industries. It is oxidized (Oxidize) by oxygen as well. The current common Composite material suitable for temperatures above 250 degrees Celsius is Poly (p-phenylene-2,6-benzobisoxazole) or PBO material is a polymer that can be use at high level heat resistance and very high temperatures do not absorb moisture and is resistant to solvents but still flexible, so it is classified as an advanced polymer. The bonds within the molecules with high strength makes PBO can be maintained under heat up to 600 degrees C. In addition PBO has high tensile strength makes it ideal in applications with space and electronics industries. The need of a new material with superior material properties for aerospace composite lightweight materials for aerospace structures, which is still limited in the field. Production costs are very high and has the high effect of corrosive and Galvanic Corrosion. Polycasonal as the filler of the thermal stability found in the liquor Precipated ash which is a waste product from the manufacture of liquor has 20-36 carbon atoms and can be used to extract crude waxes from a dry powder ashes. The obtained pure wax extracted from the fatty materials has the flexible polymer additive as the quality protection and flexibility in the bonds within the molecules with high strength makes PBO. The filler added thermal stability in the advance composite plastic materials for a spacecraft at the heat up to 600 degrees Celsius, the chemical composition and physical characteristics of the preciapted ash by the synthesis of zeolites with alkaline ash. The study optimal conditions for the synthesis of zeolite powder and ashes from the reaction temperature to 80 degrees Celsius concentration Spent alkaline 3.0 M and 2.5 M, respectively. The 4 days duration of the reaction which will provide the ability to exchange calcium ions at 473.74 cmol / kg and 286.68 cmol / kg.

Zeolite synthesis an initial study using Liquor Precipated ash focused on synthesizing zeolites/zeolitic materials by hydrothermal activation heating. Samples of Liquor Precipated ash were collected by electrostatic precipitation during the combustion of Sura Bangyikhan Co., Ltd. plant: Each sample was sieved through a 100 mesh Tyler screen and calcined at 75OoC in air before being analyzed by atomic absorption spectroscopy. Si02 and A1203 were the major components and are the most important reagents for zeolite synthesis. Other crystalline phases identified included mullite (A16Siz&), quartz (SiOz), hematite (FezO,), and lime (CaO). Each Liquor Precipated ash was activated by NaOH and KOH solutions in a closed system. The activations were conducted using a number of Parr digestion bombs equipped with Teflon reactors. The result shows the zeolite synthesis route investigated. Typically, 10.0 g of Liquor Precipated ash was combined with 12.0 g of alkali hydroxide and placed into acovered platinum crucible and slowly heated to 55OoC . After one hour, the resultant fused Liquor Precipated ash! NaOH mixture was then cooled to ambient temperature and re-ground. About 6 g of fused fly ash/NaOH powder was added to 30 mL of deionized water in a closed Teflon reactor and agitated for 24 hours at room temperature. After aging the solution, the Teflon reactor was then sealed and heated to 100°C without stirring for 48 hrs. The precipitates were filtered, washed repeatedly with deionized water, and dried overnight at 105 "C. The synthesis of zeolite powder and ashes from the reaction temperature to 80 degrees Celsius concentration Spent alkaline 3.0 M and 2.5 M, respectively. The 4 days duration of the reaction which will provide the ability to exchange calcium ions at 473.74 cmol / kg and 286.68 cmol / kg.

Increasing interest in the properties of high temperature resistant wood composite and their applications in the industry, as an efficient replacement for metals and other materials, is based on our ability to create and change their structures over a wide range. This enables property improvement - including modification of tribological wood composite properties. The main problem of wider use of the composite is their strong behavioral dependence on temperature that

is reflected in their mechanical properties, as well as their low thermal conductivity, tendency to creep and its sensitivity to environmental effects. Tribological properties of the high temperature resistant polymers depend on their composition, but also depend on the thermal history such as different temperatures of solidification. All these affect the surfaces and thereby tribological properties. Further progress in determination and improvements the tribological properties of polymers i.e.

Their composites and blends are possible by finding links between the friction factors and the mechanisms, but also by modification of surface structures at micro- and nano-levels. New possibilities of application of the composite depend on the results of further investigation of their mechanical and tribological behavior – given new challenges in science and technology. Characteristics and properties of polymers such as viscoelastic behavior, brittleness, free volume and changes in the structure formed by addition of components or various modifications during processing are important in establishing functional connections with the tribological behavior of the plastic composite. Tribological behavior of polymers can be also investigated by computer simulation of structure and its changes, as well as the effects of structure on the tribological properties as a confirmation and/or as the replacement for the experiments. Surface tension and tribological properties (friction, scratchability and wear) are surface phenomena and their relationships are useful for optimizing desired properties. We have discussed above connections of surface tension (believed to be the domain of physical chemists rather than engineers) to tribological properties. We believe that examples discussed in this article demonstrate the need for sufficient inclusion of polymer tribology into university instruction – as well as for more research in this area.

4. CONCLUSIONS

This research aims to study the application of Brewer's spent grain (BSG) as wood-substituted biocomposites in high density fiberboard. The fiber:non-urea formaldehyde glue: Concentrated latex glue with polymeric diphenymethane diisocyanate type (pMDI) ratio is equal to 1: 0.13: 0.003. The fibers are taken from Brewer's spent grain (BSG) that 7 ratios are used to all of fiber mixing. The fiberboard production use 130°C of temperature with 20 – 50 kg/sq.cm of compressive pressure with 8 minutes per piece of rate. Their fiberboards have 603 – 856 kg/m of density that was tested follow the TIS 876-2547 standard. Resulting, it can pass the standard in physical properties and mechanical properties. Moreover, their fiberboards have good thermal insulation. This project focuses on the development of the method of application of the Nano Titanium Dioxide (TiO2) for Antioxidant Phenolic High Performance wood composite with Killer MERS From Brewers' spent grain as the Photocatalyst can stimulate the antioxidant activity. By considering the design, use of appropriate technologies and low cost price, the general public can own production, which will result in reducing natural resources in the production of woodchip. Increase the potential of the most abundant by-product generated from the beer-brewing process that could be the pollution and sustainable development in the future for modern skin care business and promotion for Beverage and Cosmetic.

Products derived from Liquor Precipated ash were explored for their potential applications as molecular sieves, catalytic applications, and catalyst supports. The Liquor Precipated ash derived zeolite with up to 75% conversion was prepared by the developed zeolite synthesis technique. X-ray diffraction analyses from the prepared zeolite are in accord with that of the natural zeolite-P.

The Liquor Precipated ash derived carbon demonstrated good activities for the chemical composition and physical characteristics of the preciapted ash by the synthesis of zeolites with alkaline ash. The study optimal conditions for the synthesis of zeolite powder and ashes from the reaction temperature to 80 degrees Celsius concentration Spent alkaline 3.0 M and 2.5 M, respectively. The 4 days duration of the reaction which will provide the ability to exchange calcium ions at 473.74 cmol / kg and 286.68 cmol / kg.

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Pessimism in Anita Desai 'Cry, The Peacock'

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Abstract

Anita Desai is renowned feministic writer. Her style of writing of completely different from contemporary writers. Throughout her novels, she throws light on feminine psyche and agonies in Indian woman life. She tries to present the agony which goes unheard in traditional wall of Hindu family. The present paper aims to present pessimism, alienation, and marital discord in the married life of Maya.

Keywords agitation intimidation illusion detached deficiency

Introduction

Maya's relationship with reality passes through three phases. The first phase of her life was her childhood, when she only saw the limited world. The sound phase of her life with Gautama when she makes attempts to recall into her past. And the final phase is her surrender to the world of fears and to insanity.

In the very beginning we find that Maya was not accepting the truth of her pet dog death, Toto when she looked the Toto's dead body she screamed and rushed to the garden and cry, into the house. The sorrow of her pet's death and detached behaviors of Gautama towards this incident make her lonely and pushes her back into her childhood memories brought her to the past where she thought that all the world is of toy where she used to take breakfast with her father in the garden and point her world with her favorite colors. She lives into the fantasies world of be arts and luxury. For her the toy's world was real than the real world. But when her grownup she understood it was the entire unnatural world that she had past. But her real world was horrifying that had changed her life. She had grown up like a princess of her father who had not seen and kind of ugliness and sorrows. She gets lavish pleasure by seeing the bear's dance Maya's childhood has been carefree, perhaps more so in memory that reality. Maya feel somewhat pleasure when she thinks of her childhood days but coming in the past she horrifies herself. She says:

"Its pretense was real and truly physical-shadows
cast by trees, split across the leaves and grasses towards
me, with horrifying swiftness….. I leapt from my chair
in terror, overcome by a sensation of snakes coiling and
unlocking their moist lengths about me, of evil descending
from an overhanging branch, of an insane death,
unprepared for, heralded by deafening drum beats. *CP 12-13*

Maya was nature lover. She has many flowers in her garden. She recognizes each and every flower with their perfume. The end of the flowering season means:

a sense of all good things coming to an end and only
the long, weary summer to look forward to……..a
Sunday evening sense that proceeds each tedious Monday. *CP 19*

Maya needs the same attention and understanding as her father, but her husband does not notice anything. She utters "more aware of a world that lay beyond the enclosed one which Gautama and I, And recently, the smart shadow of the pale albino, inhabited" *CP: 56*. Actually she wants Gautama spend time and tries to understand her. Gautama on the other hand has no time from his busy his official work. Maya, always tries to suggest her physical and emotional need to her husband by action but Gautama has no maturity and understanding for her feeling and he ignores the need of Maya. Gautama gave an opal ring to wear on Maya's finger but he did not notice the skin beneath the blue flashing veins that has become translucent. Maya brood over Gautama's coldness:

> Showing how little he knows of my misery, or how to comfort me. But then, he knew nothing that concerned me. Giving me an opal ring to wear on my finger, he did not notice the translucent skin beneath the blue flashing veins that ran under and out of the bridge gold…..telling me to go to sleep while he worked at his papers he did not give another thought to me…. It is hardness…. No, no hardness, but the distance he coldly keeps from me. *CP 9*

Maya longs for companionship from her husband which she never gets in his life. In this way his mechanical attitude against Maya is the major reason of Maya's pessimism. But when she meets her friends Pom and Leila, she was unsatisfied. She got disturbed by their problems, and it affects her greatly, as she gets emotionally involved with them. She was in need of proper attention from Gautama, but her husband refuses it so. She is so obsessed with the predicted disaster that every trivial thing becomes an intimidation of the forth coming disaster, and she is frightened by the prospects of death. She was in love with life, with the idea of death looming large on her mind. Maya lives in duality of life and death, illusion and reality, and she fails to reconcile them. This duality exists till the end of the novel. Maya was not ready to compromise. She refuses to participate in the world of others and Maya loses all her sanity completely and she becomes a criminal by killing Gautama by pushing him off the roof, and she herself descends irrevocably into the world of past.

There is also a clash between two philosophical levels represented by Maya and Gautama. Gautama explains the teaching of 'The Bhagatvita' He points out the deficiency in her outlook towards life as she lacks detachment:

> Life is a fairy tale to by you still
> What have you learnt of realities?
> The realities of common human existence, not love and
> Romance, but living and dying and working, all that
> constitutes life for the ordinary man. *CP 15*

After worse condition she is fully contented with her life, which is complete for her. She tells Gautama:

> I do not care to detach myself into any other world
> than this. It is not boring for me … the world is
> full-full Gautama. Do you know what that means?
> I am not bored with it that I should need to hunt
> another one! (Cry, the Peacock: 117-118)

In this connection Jasbir Jain has posed the query "Who is involved and who is detached in the true sense? Gautama who needs to keep himself busy and engaged in actively, or, Maya, who's inner being creates a full life? Who is wiser of the 'two Gautama who dreads passion, or Maya who is lost in emotion? (Jain-73)

Conclusion

To conclude, Anita Desai examines the pessimism and complexities of human relationship in this novel. The two wide different characters, Maya and Gautama united in marriage; as such, they are incompetent to lead a harmonious and determined family life. Pessimism arose in the life of Maya due to lack of marital disharmony and mutual understanding between Maya and Gautama.

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Effect of changing Climate pattern on Agriculture and AquaticBio-Diversity

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Abstract

Research paper explores impact of climate change on agriculture and ocean biodiversity.Human activities are mainly responsible for climate change. Now days, rapid climate change is challenge for serviavalance for life on earth. Major changes in food chain, watersources, medicinalplants, pure oxygen demands and temperatureimpactson climate changeof oceanbiodiversity i.e. in aquatic animal life. Similarly, these effects are also reflected on agriculture field.The average surface temperature is increasing by various factors which cause less productivity. Mainfactorssuch asirregularrainfall, increased surface temperature and increased concentration of CO_2in atmosphere. Similarly due to such effects nutritional value of food and productivity is decreased.

Introduction

Climate change and agriculture are interrelated processes, both of which take place on a global scale. Climate change affects agriculture in a number of ways, including through changes in average temperatures, rainfall, climate extremes (e.g., heat waves), changes in pests and diseases, changes in atmospheric carbondioxide and ground level ozone concentrations, changes in the nutritional quality of some foods and changes in sea level.

Climate change is mostly affecting agriculture, whose effects unevenly distributed across the world. Future climate change will negatively affect crop production . Climate change will probably increase the risk of food security for some extent.Despite technological advances, improved varieties, genetically modified organisms, and irrigation systems, is still a key factor in agricultural productivity, as well as soil properties and natural communities. The effect of climate on agriculture is related to variability in local climates rather than in global climate patterns. The Earth's average surface temperature has increased.

The climate change induced by increasing greenhouse gases is likely to affect crops differently from region to region.

Climate change has already impacted on the biodiversity and projected to be more significant in incomingdays. Loss sea ice threatens biodiversity across entire earth planet. Related pressure, ocean acidification, carbon dioxide resulting from higher concentration in the atmosphere is the major cause observed. Due to irregular rain fall and increasing surface temperature food chain on land and water gets disturbed.

- **Effect of climate change on variousfactorsaffecting agriculture.**

1. **Effect of elevated carbon dioxide on crops**

Carbon dioxide is essential to plant growth. Rising concentration in the atmosphere can have both positive and negative consequences. Increased CO_2 is expected to have positive physiological effects by increasing the rate of photosynthesis. This is known as 'carbon dioxide fertilization'. Currently, the amount of carbon dioxide in the atmosphere is 380 parts per million. In comparison, the amount of oxygen is 210,000 ppm. This means that often plants may be starved of carbon dioxide as the enzyme that fixes CO_2,alsorubisco fixes oxygen in the process of photorespiration. The effects of an increase in carbon dioxide would be higher on such as wheat than on such as maize, because the former is more susceptible to carbon dioxide shortage. Studies have shown that increased CO_2 leads to fewer stomata developingon plants which have led to reduce water usage. Under optimum conditions of temperature and humidity, the yield increase could reach 36%, if the levels of carbon dioxide are doubled. A study in 2014 posited that CO_2 fertilization is underestimated due to not explicitly representing CO_2 diffusion inside leaves.

Further, few studies have looked at the impact of elevated carbon dioxide concentrations on whole farming systems. Most models study the relationship between CO_2 and productivity in isolation from other factors associated with climate change, such as an increased frequency of extreme weather events, seasonal shifts, and so on.

2. **Effect on quality**

According to the IPCC's report, "The importance of climate change impacts on grain and forage quality emerges from new research,concentrations of iron and zinc, which are important for human nutrition, would be lower. Moreover, the protein content of the grain decreases under

combined increases of temperature.Studies have shown that increases in CO_2 lead to decreased concentrations of micronutrients in crop plants. This may have knock-on effects on other parts of ecosystems as herbivores will need to eat more food to gain the same amount of protein.

Studies have shown that higher CO_2 levels lead to reduced plant uptake of nitrogen (and a smaller number showing the same for trace elements such as zinc) resulting in crops with lower nutritional value.This would primarily impact on populations in poorer countries less able to compensate by eating more food, more varied diets, or possibly taking supplements.

Reduced nitrogen content in grazing plants has also been shown to reduce animal productivity in sheep, which depend on microbes in their gut to digest plants, which in turn depend on nitrogen.

3. **Erosion and fertility**

The warmer atmospheric temperatures observed over the past decades are expected to lead to a more vigorous hydrological cycle, including more extreme rainfall events. Erosion and soil degradation is more likely to occur. Soil fertility would also be affected by global warming. However, because the ratio of carbon to nitrogen is a constant, a doubling of carbon is likely to imply a higher storage of nitrogen in soils as nitrates, thus providing higher fertilizing elements for plants, providing better yields. The average needs for nitrogen could decrease, and give the opportunity of changing often costly fertilization strategies.

Due to the extremes of climate that would result, the increase in precipitations would probably result in greater risks of erosion, whilst at the same time providing soil with better hydration, according to the intensity of the rain. The possible evolution of the organic matter in the soil is a highly contested issue: while the increase in the temperature would induce a greater rate in the production of minerals, lessening the soil organic matter content, the atmospheric CO_2 concentration would tend to increase it.

4.Climatechange effecton pests, diseases and weeds.

A very important point to consider is that weeds would undergo the same acceleration of cycle as cultivated crops, and would also benefit from carbonaceous fertilization. Since most weeds are higher plants, they are likely to compete even more than now against crops such as

corn. However, on the other hand, some results make it possible to think thatweed killers could gain in effectiveness with the temperature increase.

Global warming would cause an increase in rainfall in some areas, which would lead to an increase of atmospheric humidity and the duration of the wet seasons. Combined with higher temperatures, these could favor the development of fungal diseases. Similarly, because of higher temperatures and humidity, there could be an increased pressure from insects and disease vectors.

5. Ozone and UV

Some scientists think agriculture could be affected by any decrease in stratospheric ozone, which could increase biologically dangerous uv. Excess ultraviolet radiation can directly affect plant physiology and cause massive amounts of mutations, and indirectly through changed pollinator behavior, though such changes are not simple to quantify. However, it has not yet been ascertained whether an increase in greenhouse gases would decrease stratospheric ozone levels.

In addition, a possible effect of rising temperatures is significantly higher levels of ground-level ozone, which would substantially lower yields.

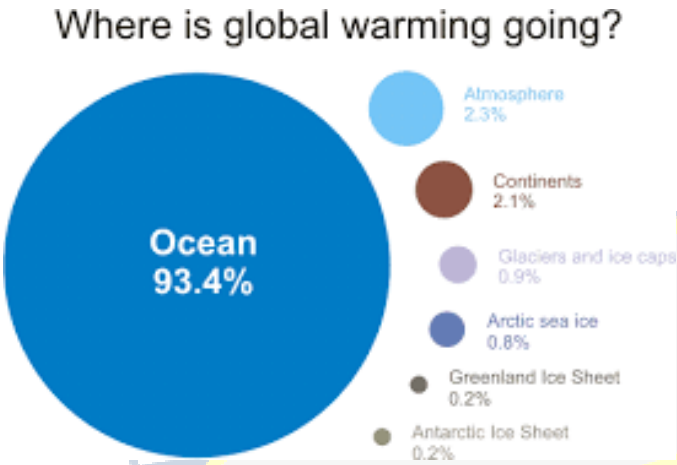
- **IMPACT OF CLIMATE CHANGE ON AQUATICBIODIVERSITY**.

Ecosystems are already showing negative impacts under current levels of climate change…..which are modest compared to future projected changes .in addition to warming temperatures more frequent extreme weather events and changing pattern of rain fall and drought can be expected to have significant impacts on biodiversity. Some species may benefits from climate changebut rapid nature of the change suggest that most species will not find it as beneficial as most will not be able to adapt. The highest rate of warming and this trend is projected continue as global biodiversity. It is not just reduction in extent of sea ice but it thickness and age. Maximum impact observed on aquatic animal life than terrestrial animal total food chain is disturbed due to climate change factor.

- **Climate change means ocean change**

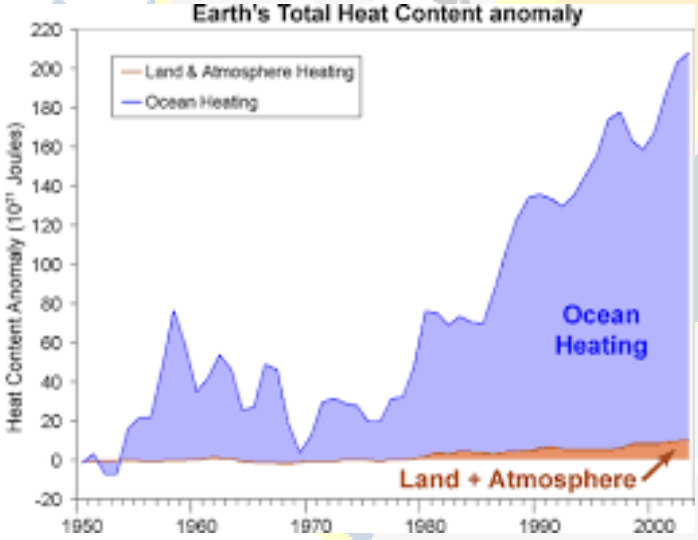
When we talk about the impacts of climate change we mostly hear about changes to lands and planet's surface or atmosphere. However most of warming is going in to ocean where lots of

ecosystem changes are also occurring mainlygreenhouse gases are responsible for global warming-oceans are able to absorb some of the excess of carbon dioxide released by human activity. as shown below 93.4% global warming going in to the ocean.



Source ;-john cook ,info graphic on where globalwarming is going,20 Jan 2011

Following graph also shows warming in the ocean has been occurring for some time

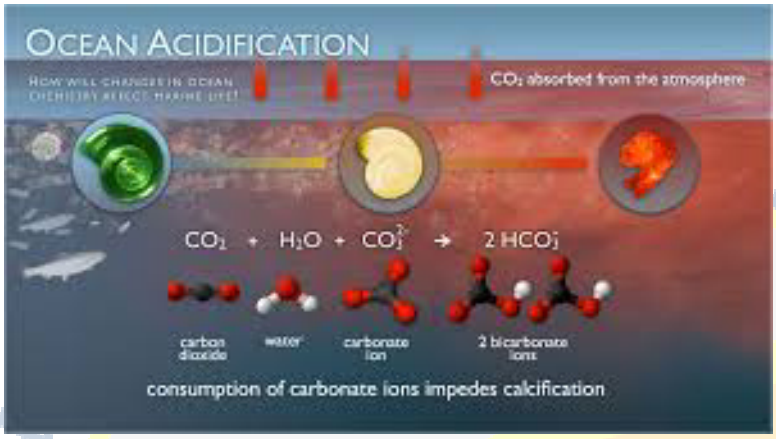


source :- john burno, its not climate change its ocean change12 jul 2010.

- **Chemistry affects to increase ocean acidification and its biodiversity**

The chemistry affects to increase ocean acidity when additional excess is absorbed by ocean. When CO_2 reacts with water it produces weak acid called as carbonic acid. Due to change

in total acidity of sea water and concentration of carbonate irons is decreasing and increases hydrogen ions concentration day by day. And this increased acidity results in changing system of ocean and also this disturbs ability of plants and animal in ocean to make shells and skeletons of calcium carbonate. The animals and plants which are surviving in the ocean are directly affected by this climate change and their food chain is disturbed.



Source:- pacific marine environment laboratory .

Conclusion: Main reasons for climate change are human activity such as increasing use of chemical fertilizers, releasing of industrial waste chemical water water source whichcreates acid rain and salinity of water, release of poisonous gases directly in to air. To overcome impacts of climate change on agriculture and biodiversity is challenge in front of us. Day by day human is going to achieve various new inversions on the other hand negative impacts on climate areobserved. Now days if we green chemistry principles it would be very beneficial for us. Human can't control climate change but can help to decrease it.

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Contribution of Livestock towards Sustainable Livelihood among the Tribes

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Abstract

The research study was conducted in Jharkhand to analysed the contributions of livestock towards the sustainable livelihood among the tribes. The livestock sector is socially and economically very significant due to its multi-functional outputs and contribution to socio-cultural and livelihood security of India. The research work was assessed through personal interviews of the selected respondents in the villages. The respondents selected by random sampling technique, personal observations and participatory rural appraisal techniques like transect walk, social mapping, key informant interview and focus group discussion. DFID- Sustainable Livelihood framework (1999) was followed for the selection of factors and indicators as it provides excellent scope to capture the multidimensional impact of Livestock Production System (LPS) on the respondent's livelihoods and weightage of these indicators were assigned by using Principal Component analysis (PCA). The primary outcome of the study was that Cattle+ Goat+ Pig (C+G+P) are the LPS that contribute maximum towards the sustainable livelihood of the respondents (Sustainable Livelihood index value- 28.02), closely followed by Cattle+ Buffalo +Goat (25.53) and Cattle + Goat (24.61).Overall, it was concluded that compared to other sustainable livelihood components, human capital had minimum sustainable livelihood index value in all production systems. Thus, the livelihoods promotion among tribal people needs a paradigm shift focusing on sustainable LPS to keep pace with food security and future challenges in the area.

Keywords: Sustainable Livelihood, Livestock Production, Principal Component Analysis

Introduction

Animal Husbandry is making ample contribution to the countrywide economy vis-à-vis social development. The livestock revolution is expected to make a significant contribution towards sustainable livelihood and reducing rural poverty. The livelihoods among tribal communities in India is complex, dynamic and multidimensional phenomenon, the observation of which varies with geographic location, type of community, age, gender, education, fluctuations in resources, services and infrastructures and social, economic, cultural, ecological and political determinants (Kumar et al. 2000). The Jharkhand has home of 32 tribal groups that make up about 26.34% (2011) of the state population and 8.2% of ST population of India. Jharkhand holds 6th rank in terms of tribes population (Census, 2011) and livestock contributes to 27% of value output from agriculture and livestock system form the major part of the lives of the tribes (Sirohi and

Chauhan, 2010). In simple terms these are combinations of the capabilities and resources people have (including social, human, financial, natural and physical assets) and the activities they undertake in order to make a living and to attain their goals and aspirations (Bhuvaneshwari, 2008). Sustainable Livelihoods Approach, are genuinely transdisciplinary as they are produced, disseminated and are applied in the borderland between research, policy, and practice (Knuttson 2006). Properly managed livestock system can play an important role in mitigating hunger and counteracting environmental degradation resulting in sustainable livelihoods. Since a livelihood comprises the capabilities, assets and activities required for a means of living, it appears that agricultural extension intends not only to increase productivity and income (Anderson and Feder, 2007; Waddington et al. 2010), but also to improve multifaceted aspects of rural life. In order to achieve sustainable livelihoods and environmental sustainability the ruminant livestock like cattle and buffaloes vis-à-vis sheep, goat, pig and poultry are important species of livestock production systems of the tribes. Moreover, livestock's are paramount importance and play important diversified activity, these livestock farming systems among the tribes are more crucial for economic development of the state in specific and country in general. Although the marginal livestock owners have limited income, they have assets and capabilities that can be strengthened to reduce their vulnerability to climate change. These assets or "capital" can be grouped into social capital, natural capital, physical capital, human capital, and financial capital (DFID, 1999). Thus keeping in the importance of livestock production systems of Jharkhand tribes was studied and the contribution of each livestock production systems to total income was analysed.

Materials and Methods

The study was based on primary data carried out during the year 2013-14 in the State of Jharkhand which was selected purposively to assess the livestock contribution in livelihood. State constitutes 24 districts, out of which two districts Dhanbad and Ranchi were selected randomly. Further, Govindpur and Ormanjhi blocks of Dhanbad and Ranchi districts of Jharkhand State were selected randomly for the study. From these two blocks, four villages were selected randomly and from each village 30 farmers were selected randomly. The research data were collected through using various data collecting method like personal interviews; personal observations and participatory rural appraisal tools i.e. transect walk, social mapping, key

informant interview, focus group discussion carried out in the villages. The study adopted Sustainable Livelihood Approach (SLA) for assessing the Sustainable livelihood through livestock production systems. DFID- Sustainable Livelihood framework (1999) was followed for the selection of factors and indicators. The responses of the respondents were taken against each factor and indicators were scored and analysed for assessing the contribution of livestock towards the sustainable livelihood of the respondents.

Selection of indicators:

To bring the values of the selected indicators within the comparable range and also to standardize their values normalization was done (Kumar et al. 2015; Maiti, 2013; Feroz et al. 2011; Nelson et al. 2010). Normalization was done by subtracting the minimum value from the observed value and dividing by range using the formula [Kaiser, 1958].

$$\text{Normalized Value} = \frac{\text{Observed Value - Minimum Value}}{\text{Range}}$$

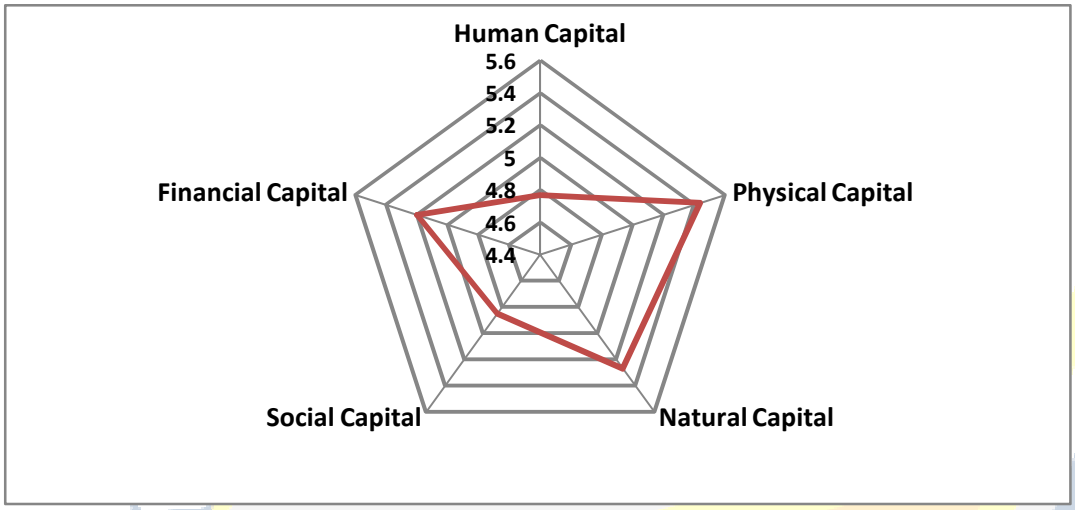
After normalization, the testing of suitability of indicators and elimination of non-significant indicators was carried out using Principal Component Analysis (PCA). PCA was used in earlier studies (Kolenikov et al. 2005; Ravindranath et. al. 2011; Maiti 2013). PCA compressed the data by reducing the number of dimensions without much loss of information. For the present study cut-off value of the communality values were decided as 0.60 for the household level and factors were selected accordingly.

Assigning Weightage to the Indicators

PCA was run again separately for three major livestock production, after selection of suitable indicators, so as to determine the weights by the factor loadings and eigen vectors were obtained. Kaiser normalisation was used to identify the eigen values greater than one. According to the number of eigen values greater than 1, the same numbers of components were extracted by using varimax rotational method for each indicator as shown in rotational component matrix. The method followed by Kolenikov and Angeles (2005); Feroz et al. (2010) and Maiti (2013) were adopted for the study to assign the weights to indicators. Then, the extracted rotated component matrix was multiplied with the 1st extracted component column and 2nd eigen value was multiplied with the 2nd extracted component column, considering only absolute values. The

values obtained were added in case of each indicator to get weight for that particular indicator. Likewise, weights were obtained for other livestock production systems.

Fig. 1 : Sustainable Livelihood Pentagon



Results and Discussion

Determinants of Sustainable Livelihood in major Livestock Production

Cattle+ Goat- Livestock Production

It was revealed from the Table 1 that Principal Component Analysis was applied for the 19 identified indicators of Sustainable livelihood and index values were obtained. Among these indicators, Extension Contact (5.960), Source of Energy (5.208) and House hold assets (5.118) had highest influence on Sustainable livelihood of the respondents. This implies that higher the extension contact of respondents, higher their livestock productions were inclined towards sustainability, and higher the SL index. The result also depicts that as the energy becomes more renewable and recyclable the sustainability of the production system increases. Energy generated from this system was mainly used for cooking, draught purpose and bullock cart used for travelling purpose. Cow dung was predominantly used for manuring the fields. It was found that as the household assets increases, the physical capital component increases and the SL index value increases.

Cattle+ Goat+ Pig - Livestock Production

For Cattle+ Goat+ Pig, Principal Component Analysis was applied for identified indicators to obtain Sustainable livelihood and index values. Among these indicators, Education of family members (5.987), Use of traditional knowledge in LPS (5.987) Farm Energy (5.954) ICT Tools (5.999), Livestock Density (6.378) and Access to natural resources (6.285) had highest influence

on Sustainable livelihood of the respondents. In C+G+P- LPS, wide variation was observed in education of family members i.e. from illiterate to graduate. It is gratifying to note that more educated the respondents were, more they were involved in Sustainable LPS. The findings were in line with the finding of Prasad et al. (2001), Rao et al. (2002) and Biradar et al. (2013). The day to day life of tribes were closely related to the traditional knowledge and natural resources, so as the use of traditional knowledge of tribes and access to natural resources increases, the production system was found to be more sustainable. Thus the table throws light to the fact that C+G+P was the most sustainable livestock production as the combination of these assets leads to more Sustainable Livelihood index value.

Cattle+ Goat+ Buffalo - Livestock Production

Principal Component Analysis was further applied for identified factors of Sustainable livelihood and index values were obtained. Among these factors, Use of traditional knowledge in LPS (5.987) Farm Energy (5.954) ICT Tools (5.719), Livestock Density(5.978) and Access to natural Resources (5.855) had highest influence on sustainable livelihood of the respondents. The Table also revealed that as livestock density and ICT tools availability increases, the physical capital component increases and the Sustainable Livelihood Index also increases. ICT tools help the farmers to get novel and up to date information on improved management practices of livestock and traditional knowledge reduces the destruction of natural capital and thus together increasing the sustainable livelihood index of the respondents.

Perusal of data presented in Table 2 revealed that C+G+P was the LPS that contributes maximum to the sustainable livelihood of the tribes. Tribes preferred goat and pig and at state level pigs have the highest ratio. Similar results were obtained in this study in which tribes are found to prefer C+G+P- LPS. It is also found that buffalo and indigenous cattle had poor return compared to goats and pigs and young buffaloes were preferred for beef purpose and the market demand for pig and goat was maximum for social functions and festivals (ILRI, 2011; Narmatha, et al. 2015).The present study also unveiled that tribes had less preference for buffalo and indigenous cattle.

In C+G+P system, management is very easy as inputs are readily available and control of unforeseen difficulties is possible whereas it requires some skill, labour and other resources for C+G and C+B+G which is the main conclusion of the tribes in focus group discussions. The bird's eye view of the SL index shows that other production systems was found close to C+G+P, this indicates that all the production systems contribute almost similar to the SL of the tribes.

Figure 1 indicated that the SL component human capital is minimum compared to other components, low education level of individual tribes as well as their family, low access to information, low awareness on rights policies and regulations were the major reasons.

Conclusions

All the above results paves way to the conclusion that the livelihoods of tribal communities in the area have traditionally been dominated Livestock Production. However, other livelihood options also play a vital role in the livelihoods of tribal people. Although the major LPS are C+G, C+G+P, C+B+G, C+B+G+Poultry, C+B+G+P, C+B+G+P+Poultry all are found to be substantially contributing for the sustainable livelihood of the respondents and are the integral part of day-to-day livelihood activities and traditional life style for tribal people in the area. Formulation of policies on Sustainable Livelihood of Tribes ensured a number of rights and concessions for tribal people. Therefore, the livelihoods promotion among tribal people needs a paradigm shift focusing on Livestock Production Systems to keep pace with sustainable development and future challenges in the area. There is enormous scope in improvement of sustainable livelihoods for tribal population through LPS, domestication of more animals, organized marketing system, proper refinement and dissemination of indigenous technologies, institutional support in training and skill development, appropriate extension and communication networks. The interventions visualized needs to be implemented efficiently for all-round development of the tribal people and for ecological stability in the study area. These outcomes serve as a solid basis for the identification of practical strategies in order to facilitate sustainable LPS for the tribes of India in general and Jharkhand in specific.

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Annexure

Table 1: Determinants of Sustainable Livelihood

S.N.	Variables	1st Run Factor analysis (PCA) Communalities						
		C+ G			C+ G+ P		C+ B+G	
		Initial	Extraction	Weightage	Extraction	Weightage	Extraction	Weightage
1	Education of family members	1.000	0.646	3.697	0.814	5.987	0.822	5.066
2	Health	1.000	0.616	3.432	0.736	4.820	0.702	4.326
3	Employment Generation	1.000	0.744	4.708	0.791	5.885	0.777	4.789
4	Use of traditional knowledge in LPS	1.000	0.730	4.512	0.814	5.987	0.899	5.541
5	Access to information	1.000	0.712	4.099	0.774	5.654	0.674	4.154
6	Farm Energy	1.000	0.665	3.900	0.966	5.954	0.966	5.954
7	Dwelling Place	1.000	0.795	4.610	0.801	5.597	0.801	4.937
8	ICT Tools	1.000	0.768	4.510	0.928	5.999	0.928	5.719
9	Source of Energy	1.000	0.894	5.208	0.840	5.947	0.840	5.177
10	House hold assets	1.000	0.845	5.118	0.879	5.597	0.879	5.417

11	Land Improvement activity	1.000	0.871	4.078	0.829	5.189	0.829	5.109
12	Access to natural resources	1.000	0.765	4.703	0.950	6.285	0.950	5.855
13	Security related to natural resource	1.000	0.763	4.843	0.674	4.654	0.674	4.154
14	Social participation	1.000	0.802	4.017	0.804	5.855	0.604	3.722
15	Extension Contact	1.000	0.947	5.960	0.795	4.990	0.795	4.900
16	Savings	1.000	0.772	5.078	0.866	5.593	0.866	5.337
17	Debt	1.000	0.668	4.715	0.850	5.639	0.823	5.072
18	Remittance of income by family members	1.000	0.840	4.703	0.895	5.716	0.911	5.615
19	Services received from financial service organisation	1.000	0.809	4.963	0.789	4.763	0.773	4.764

Table 2: Index Values of Sustainable Livelihood (SL) and its components for major LPS of the Study Area.

S .N.	LPS	Human Capital	Physical Capital	Natural Capital	Social Capital	Financial Capital	SL
1	C+G	4.40	5.31	4.98	5.39	4.53	24.61
2	C+G+P	5.28	5.70	5.63	5.44	5.47	28.02
3	C+B+G	4.77	5.44	5.27	4.85	5.20	25.53

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English Language Teaching in Primary Schools: A Pedagogical overview

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Abstract:

Qualitative primary education is considered as one of the foundational aspects of any nation's development. Formal language education is the crucial part of the primary education. Languages form the basis of imparting knowledge of every subject. In most of the states of India, three languages, namely, English, Hindi and regional language of the particular state are taught at the primary level. Out of these three, Hindi has the status of national language and English serves the associate official language. Today English plays the role of a second language in India. It has been adopted as the compulsory subject in all the primary schools. It is considered as a gateway to better career opportunities and a tool for advanced knowledge and better communication with the world. But the poor standard of English language teaching and learning, particularly in rural areas is a major concern for all the stakeholders related with education. Ineffective and monotonous pedagogies of teaching English and inefficiency of teachers to deal with them are one of the major causes of students' poor standard of learning English at the primary level. If the new effective pedagogies are evolved to cater the linguistic needs of the students and teachers are trained to implement those in classrooms, the standard of teaching and learning of English will be definitely improved. The present paper attempts to deal with the present pedagogies of English being employed in the classrooms of primary schools in India and need to evolve new ones.

Key Words: Pedagogy, ELT, Primary school, language skills

Introduction:

Today English is considered as the global language, so everyone desires to have command over it. It is a gateway to better career opportunities and a tool for advanced knowledge and better communication with the world. Practically a person can't be considered literate without having the knowledge of English. In 21st century, an era of information technology and global economy, we are so much surrounded by English that we can't move away from it.

In India English has got a significant position in public as well as in private matters. It is the official, legal and financial language in India. So, obviously English language teaching is an important aspect of education field from elementary level to the higher education. English is no more a foreign language, but the second language in India. Children start learning English from the pre-primary level in play schools, crèche, Anganwadis, kindergarten, nursery etc. unofficially and from the first standard officially along with the vernacular language. The Rapid growth of pre-primary schools in urban and rural areas shows parents' keen interest in providing

education to children in English medium. It is a known fact that many Government-aided vernacular schools in urban and rural areas are not working as per the parents' expectations, especially about English and Mathematics, as they measure their children's progress through linguistic and arithmetic skills. So parents are moving towards private English medium schools where English is taught as the first language and it is the medium of instruction and Government-aided vernacular schools are getting deserted gradually due to fewer enrollments of students.

Pedagogies of English language have been always a crucial part of English Language Teaching (ELT). The significance of English has been accepted by the world as a link language. English plays the role of a co- official language in administration and second language in schools in India. It has been made a compulsory subject from primary to higher education level by most of the state governments. But the poor standard of teaching and learning of English has been a major concern before all the stake holders of education. According a recent survey of 54 countries, India ranked 14th for the English proficiency index with a third level of "moderate proficiency" [1]. It suggests that the average proficiency level of students in all four basic linguistic skills, namely listening, reading, speaking and writing is poor. As English is not a native language, students have only alternative to learn it in schools in a formal manner. They learn it only for examinations which are focused on writing. Even the teaching methods of English used by teachers are examination oriented. So, learning English has become a monotonous task for students. Learners are all very different. Their attitudes in the classrooms are affected by their motivations, their needs, their educational cultural backgrounds, and their learning styles and personalities [2]. So, teachers need to evolve new student friendly pedagogies, which could cope up with the changing needs of the time. The present paper attempts answer two questions regarding English pedagogies. First, what is the common tradition of English teaching methods in India? And the second, why do teachers need to develop new methods for teaching English?

Pedagogies are basically, instructional methods used by teachers to impart knowledge or skills. In case of language, it refers to the activities of the teacher such as speaking, listening, writing and asking questions etc which a teacher undertakes in a classroom with the objective of transmitting curricular content to students [3]. It influences the way in which the curriculum inputs are transacted and so, it forms the crucial part of the whole teaching learning process.

In order to understand the concept of pedagogy, the comprehension of three key terms, techniques, methods and approach is important. Edward Anthony made a distinction among these

three levels, with specific reference to language learning. An approach is a set of assumptions dealing with the nature of language and language learning. A method is an overall plan for the orderly presentation of language material. A technique is that which happens within the classroom and consistent with the method [4]. So, techniques are part of the method which is consistent with the approach. Methods and techniques are more relevant to teachers who actually perform in classrooms.

English language has been a part of school curriculum since before independence. In most of the states, it has been introduced as a second or third language in vernacular schools from std. V or VII, where the medium of instruction is L1. In such schools, Grammar- Translation is the most adopted methods by primary teachers, where reading and writing are the major focus. The method approaches the language first through detailed analysis of its grammar rules, followed by application of this knowledge to the task of translating sentences and texts into and out of the target language [5]. Understanding the literary text through translation in native language is the primary focus of teaching and there is little need to improve listening and speaking skills of L2. It has been the most suitable method of teaching English for teachers rather than for students.

'Need is the mother of invention'. This is quite true with current status of English as a link language. With the changing times, particularly in India, with the beginning of LPG (Liberalization, Privatization and Globalization) in 1991, the expectations from the English language learners also changed. 'Communicative Competence' became the key word in ELT. The change in language teaching approach from Grammar-Translation method to Communicative approach is understood by English medium schools to some extent, but the vernacular schools, especially in rural areas remained backward in this context.

Today, English language has been made compulsory from standard first by most of the state governments in India, considering the growing importance of it. But still the poor standard of English language teaching and learning is a major concern for all the stakeholders related with education, especially parents whether rural or urban who want to provide quality education to their children. The seriousness of this problem can be understood from the students, even at the post graduate level who are not proficient enough to apply linguistic skills in their academic and routine life. The problem is not only limited with rural students but also with the urban students. The root of the problem lies in imparting language education at the primary level.

Teaching English as a second language to non native learners at primary level is really a challenging task. The important place where students get exposure to English is their classroom.

So, the language contents need to be imparted to them with suitable method which could encourage them to learn language. As India is a diversified country with respect to geography, culture, language, and social status, one particular teaching method will not prove to be a suitable method for all the classrooms. Every student is a unique personality and so each classroom is a unique one. Every teacher has to keep it in mind and devise new pedagogies to deal with students.

It is commonly experienced that most of the students are weak in basic language skills. Though some students are good on report cards, they are incapable of applying language skills in practical life. The major reason behind their poor linguistic performance is the inadequate language exposure at the primary level. The teachers at the primary level couldn't develop interest in learning English among students. Gradually students started feeling English as an unnecessary burden imposed on them. After completing the primary education, when these students entered the secondary school, they found a large gap between their current linguistic capabilities and the expected capabilities at that level. This is the common picture of students in secondary and higher secondary schools, especially in the rural areas. So, there is a tremendous need to evolve new pedagogies or modifying the existing pedagogies which will cope with the students' abilities, especially at the primary level to develop English fear-free generation.

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