ISSN.2249-2569

INTERNATIONAL RESEARCH JOURNAL OF HUMANITIES, ENGINEERING & PHARMACEUTICAL SCIENCES

(An International Registered Research Journal)

www.ijheps.org

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ARTICLE 1

COMPARISON OF TWO DIFFERENT BREATHING TECHNIQUES AFTER CORONARY ARTERY BYPASS GRAFTING

Dr. Akanksha Singh*, Dr. Anil K. Mishra[1], Mr. Wasim Ahmed[2]
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Abstract:

This research work mainly focuses on the Comparison of two different breathing techniques namely Deep Breathing Exercise with incentive Spirometery and only Deep Breathing exercises and to see the overall effect of these exercises on the patients operated with Coronary Artery Bypass Grafting. CABG is the operative procedure to cure the patients who are in condition of Coronary artery Blockage. Blockage (plaque) causes the insufficient blood (oxygen) to the heart which ultimately results in intense Chest pain (angina) with other symptoms like Dyspnoea, discomfort which further results into Heart Attack, and other cardiac disorders. For this research two groups of 15 people each were taken and the post operative comparative data has been collected for both the group for four consecutive days. The data obtained were statistically analyzed with student 't' test and with comparative paired 't' test. The result shows Deep Breathing Exercises with incentive Spirometery is more effective than only using Deep Breathing Exercises in preventing pulmonary complications after CABG.

Introduction

Coronary artery bypass grafting (CABG) is a type of surgery that improves blood flow to the heart. It's used for people who have severe coronary heart disease (CHD), also called coronary artery disease. CHD is a condition in which a substance called plaque (plak) builds up inside the coronary arteries. These arteries supply oxygen-rich blood to your heart. Plaque is made up of fat, cholesterol, calcium, and other substances found in the blood. Plaque can narrow or block the coronary arteries and reduce blood flow to the heart muscle. If the blockage is severe, angina, shortness of breath, and, in some cases, heart attack can occur. (Angina is chest pain or discomfort.) CABG is one treatment for CHD. During CABG, a healthy artery or vein from the body is connected, or grafted, to the blocked coronary artery.

The grafted artery or vein bypasses (that is, goes around) the blocked portion of the coronary artery. This creates a new passage, and oxygen-rich blood is routed around the blockage to the heart muscle. A decrease in pulmonary function is well known after open heart surgery. Chest physiotherapy routinely used in order to prevent or reduce pulmonary complications after CABG. Post-operative treatment includes mobilization, change of position, breathing exercises and coughing techniques.

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Pharmaceutical Approach /Drug Therapy

Aspirin (anti-platelet agent)

Low dose of aspirin (75-150 mg) reduces the risks of acute myocardial infarction in patients with angina, hence should be prescribed to all patients.

Nitrates

Their beneficial effect in angina is due to reduction in preload(venous or capillary dilatation) and after-load (anterior dilatation) and increase in myocardial oxygen uptake coronary vasodilatation).

Beta-adrenoceptor blockers

By blocking the beta receptors in the heart, they reduce heart rate, blood pressure and myocardial contractility thus lower myocardial oxygen demand. A beta receptor antagonist drug should not be withdrawn suddenly because there is risk of precipitation of arrhythmias, myocardial infarction and worsening of angina called the beta-blockers withdrawal syndrome.

Calcium channel blockers

These drugs block the slow channels of calcium through the membrane of excitable cells of heart and smooth muscles of blood vessels thus lower blood pressure and myocardial contractility reduce the myocardial oxygen demand and relieve an angina attack.

Methodology

Design of study:

Pretest-posttest experimental research design

Place of study:

Subjects will be selected randomly from various hospitals where the cases will be available within Uttar Pradesh.

Sample size:
30 coronary artery bypass patient will be taken. Patients were randomly divided in two groups of each having 15 patients. First was experimental group and second one was control group.

Selection criteria:
Inclusion criteria:
(i) Age-50-75 years
(ii) Co-operative
(iii) Median sternotomy
(iv) Coronary artery bypass grafting with sephanous vein graft or with left or right internal mammary artery.
Exclusion criteria:
(i) Angina
(ii) Previous open heart surgery
(iii) Renal dysfunction requiring dialysis
(iii) Circulatory instability
(iv) Poor oxygenation
(v) Sternal pain
(vi) Confusion
(vii) Failure to cooperate

Instruments:
An inch tape is useful in assessing the chest expansion during inspiration while a thermometer is useful for measuring the body temperature. Incentive spirometery is used here in group-1 with deep breathing Exercises.

Procedure:
30 patients scheduled for coronary artery bypass grafting will be considered for the study. Before surgery the patients shall randomly assigned to two groups. First group is deep breathing exercise with blow bottle device and another group having only deep breathing exercise. Temperature and chest expansion of each patient in both group measured preoperatively. In both groups patients will be instructed to perform a maximal inspiration, while expiration was ended at approximately functional residual capacity to avoid airway closure.[10] Patients were instructed to perform deep breathing exercise with blow bottle device in first group and only deep breathing exercise in second group from first postoperative day regularly. On the fourth postoperative day once again temperature and chest expansion of each patient was measured. For measuring the chest expansion asked patient to inspire as much as can and placed an inch tape on the fourth intercostals space.

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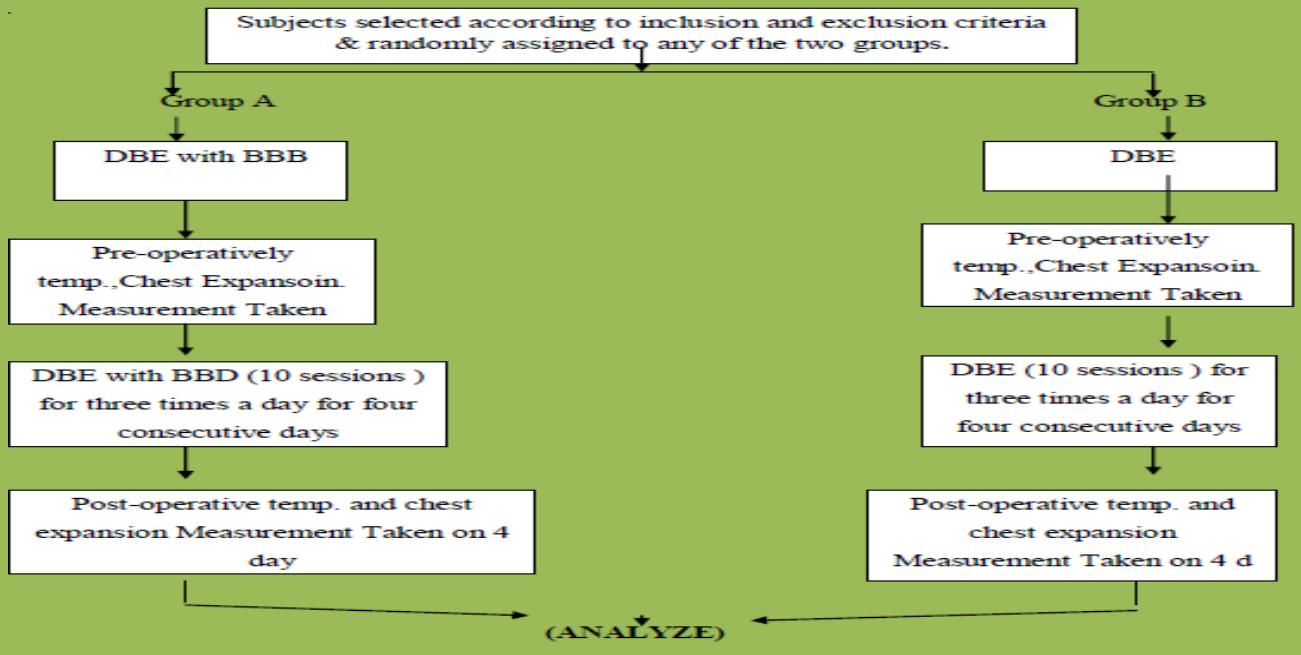
Protocol:
Prior to Participation each subject was given a detailed consent form. On the basis of the criteria mentioned above the subjects were randomly assigned to any of the two groups.



Data Analysis

Statistical analysis was done using SPSS 15.0 software. An independent t ,test was used to compare the changes in temperature and chest expansion in two groups at pre-operative and post-operative on day 4th.Paired t-test was used for compare the data between group 1 and group 2.

Results

The present study was carried out to compare the efficacy of two different treatment techniques for prevention of pulmonary complications after coronary artery bypass grafting. A total of 30 patients after coronary artery bypass grafting were enrolled in the study. They were divided into two equal groups according to treatment technique. The group wise distribution of patients is shown in table 1 below.

Table 1-Group wise distribution

S.No.	Group	Description	No. of subjecsts	Percentage
1	A	DBE WITH IS	15	50
2	B	DBE	15	50

The temperatures of patients were measured pre-operatively and post-operatively day 4th.

Table 2-Mean tempraure at different time

S.No.	Time	Group A		Group B	
		Mean	SD	Mean	SD
1	Pre-operative	97.0467	0.58171	96.8000	0.63019
2	Post-operat. day 4	97.8733	0.54703	97.7600	0.48874

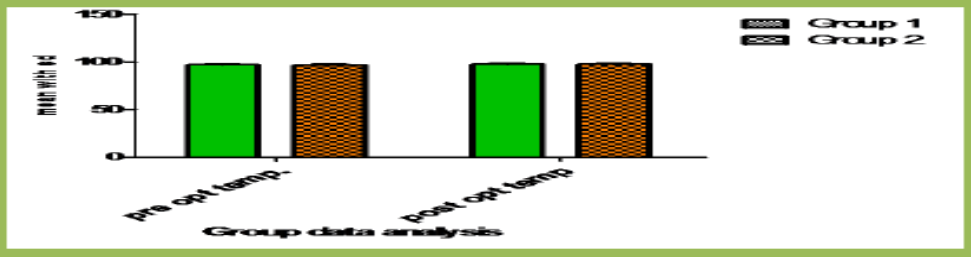
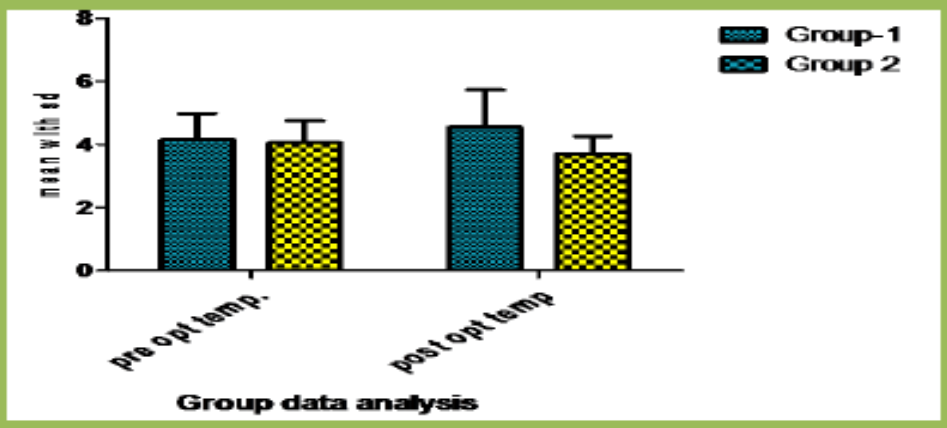


Table 3: Mean chest expansion measurement at different time

S.No.	Time	Group A		Group B	
		Mean	SD	Mean	SD
1	Pre-operative	4.1667	0.81650	4.0667	0.7037
2	Post-operative day 4	4.5667	1.17817	3.7000	0.5606



Discussion

Post-operative chest expansion of group A (mean=4.5667) is more than group B (mean=3.700) and the difference is significant at 0.05 level with p value = 0.016< 0.05 and t value = 2.573.It shows that subjects of group A have better chest expansion than subjects of group B after treatment. Post-operative temperature of group A and group B do not have significant difference. It illustrates that there is no significant difference in temperature of patients of both group after treatment.

Conclusion

After analyzing the result we can conclude from the study that the group A patient shown greater prevention of pulmonary complication as compared to group B over a period of four days after coronary artery bypass grafting. The study therefore conclude by rejecting the null hypothesis “Deep breathing exercise with blow bottle device show no highly beneficial effect than deep breathing exercise without any mechanical device” and accepting the experimental hypothesis “Deep breathing exercise with blow bottle device are effective than deep breathing exercise without any mechanical device in prevention of pulmonary complication after coronary artery bypass grafting.” The study may provide rational for the clinical use of deep breathing exercise with blow bottle device.

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ARTICLE

2

IN-VITRO DISSOLUTION ENHANCEMENT BY DEVELOPMENT OF IMMEDIATE RELEASE DRUG DELIVERY SYSTEM OF ROSUVASTATIN CALCIUM 10 MG TABLETS

Ms. Shalini Gupta*, Mr. Saurabh Srivastava, Mr.Irfan Ahmed
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Abstract:

The purpose of this research work was to established Rosuvastatin 10 mg Immediate Release tablet to improved dissolution profile. Rosuvastatin Calcium formulation used sodium starch glycollate as super-disintegrent and Dibasic-Calcium Phosphate used as stablizing agent. Tablets were evaluated by different parameters such as thickness, hardness, friability, weight variation, In-vitro dissolution studies, content of active ingredient, stability studies and FT-IR studies .The evaluated property of the finished product complies with the In-house specification. In vitro release from the formulation was studied as USP dissolution procedure. The formulation gave an immediate release effect. The Stability Study of optimized batch was carried out for one month as per ICH guidelines and no changes were found. Present study concluded that tablet of Rosuvastatin 10 mg suited for therapy anti-hyper-lipidemic.

Introduction

Despite tremendous advancement in drug delivery the oral administration of drugs has been the most common and preferred route for delivery of most therapeutic agents. It remains the preferred route of administration investigated in the discovery and development of new drug candidates and formulations. The popularity of the oral route is attributed to patient acceptance, ease of administration, accurate dosing, cost-effective manufacturing methods, and generally improved shelf-life of the product.

The conventional tablets are usually administered frequently which will lead to the fluctuation of drug plasma concentration which may cause an inefficient treatment and side effects. Sustained release tablets are commonly taken only once or twice daily and can achieve predictable and reproducible release rates, extended duration of activity for short half-life drugs, decreased toxicity and reduction of required dose, optimized therapy and better patient compliance. Pharmaceutical tablets are the dominant dosage forms for drug delivery, occupying two thirds of the global market.

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Generally, they are produced by compressing dry powder blends consisting of a number of components with different functionalities in a die. With advancement in technology and increase in awareness towards modification in standard tablet to achieve better acceptability as well as bioavailability, newer and more efficient tablet dosage forms are being developed. The main reason behind formulation of different types of tablets is to create a delivery system that is relatively simple and in expensive to manufacture, provide the dosage form that is convenient from patient's perspective and utilize an approach that is unlikely to add complexity during regulatory approval process. Rosuvastatin is a selective, competitive inhibitor of HMG-CoA reductase, the rate-limiting enzyme that converts 3-hydroxy-3-methylglutaryl-coenzyme A to mevalonate, a precursor of sterols, including cholesterol. As it has long half-life (19hrs). One of the most important oral novel drug deliveries is immediate release dosage form. The most important advantage of immediate release dosage form is immediate therapeutic effect, minimizing its side effects while improving the management of the diseased condition patient compliance. Immediate release dosage form can increase the efficiency of the drug. A gradual and continuous release of the drug to maintain effective blood level over a pre determined period of time is achieved.

Main aim and object of this present work is to formulate Rosuvastatin Ca. 10 mg film coated tablets using different concentrations of polymeric solution.

Immediate Release Drug Delivery System:

Tablet is the most popular among all dosage forms existing today because of its convenience of self administration, compactness and easy manufacturing; however in many cases immediate onset of action is required than conventional therapy. To overcome these drawbacks, immediate release pharmaceutical dosage form has emerged as alternative oral dosage forms. There are novel types of dosage forms that act very quickly after adminstration. The basic approach used in development tablets is the use of superdisintegrants like Cross linked carboxymelhylcellulose (Croscarmeliose), Sodium starch glycolate (Primogel, Explotab), Polyvinylpyrrolidone (Polyplasdone) etc. which provide instantaneous disintegration of tablet after administration. Immediate release liquid dosage forms and parenteral dosage form have also been introduced for treating patients. Liquid dosage form can be suspensions with typical dispersion agents like hydroxypropyl methylcellulose, AOT (dioctylsulfosuccinate) etc. The development of immediate release therapy also provides an opportunity for a line extension in the marketplace, A wide range of drugs (e.g., neuroleptics, cardiovascular drugs, analgesics, antihistamines, and drugs can be considered candidates for this dosage form. As a drug entity nears the end of its patent life, it is common for pharmaceutical manufacturers to develop a given drug entity in a new and improved dosage form. A new dosage form allows a manufacturer to extend market exclusivity, while offering its patient population a more convenient dosage form or dosing regimen. In this regard, immediate release formulations are similar to many sustained release formulations that are now commonly available. Drug delivery systems (DDS) are a strategic tool for expanding markets/indications, extending product life cycles and generating opportunities. Oral administration is the most popular route for systemic effects due to its ease of ingestion, pain, avoidance, versatility

and most importantly, patient compliance. Also solid oral delivery systems do not require sterile conditions and are therefore, less expensive to manufacture**.** Patient compliance, high-precision dosing, and manufacturing efficiency make tablets the solid dosage form of choice. Excipients and equipments choices will be significantly affected should solid dosage form technologies change in response to the unprecedented shifts in the drug discovery such as genomics. Injections generally are not favoured for use by patients unless facilitated by sophisticated auto injectors. Inhalation is one good alternative system to deliver these drugs, but the increased research into biopharmaceuticals so far has generate predominantly chemical entities with low molecular weights. The term "immediate release" pharmaceutical formulation includes any formulation in which the rate of release of drug from the formulation and/or the absorption of drug, is neither appreciably, nor intentionally, retarded by galenic manipulations. In the present case, immediate release may be provided for by way of an appropriate pharmaceutically acceptable diluents or carrier, which diluents or carrier does not prolong, to an appreciable extent, the rate of drug release and/or absorption. Thus, the term excludes formulations which are adapted to provide for "modified", "controlled", "sustained", "prolonged", "extended" or "delayed" release of drug. In this context, the term "release" includes the provision (or presentation) of drug from the formulation to the gastrointestinal tract, to body tissues and/or into systemic circulation. For gastrointestinal tract release, the release is under pH conditions such as pH=1 to 3, especially at, or about, pH=1. In one aspect of the invention a formulation as described herein with a compound of formula (I), or an acid addition salt thereof, in crystalline form releases drug under a range of pH conditions. In another aspect of the invention a formulation as described herein with a compound of formula (I), or an acid addition salt thereof, releases drug under pH conditions such as pH=1 to 3, especially at, or about, pH=1. Thus, formulations of the invention may release at least 70% (preferably 80%) of active ingredient within 4 hours, such as within 3 hours, preferably 2 hours, more preferably within 1.5 hours, and especially within an hour (such as within 30 minutes), of administration, whether this be oral or parenteral. Most of these conventional drug delivery systems are known to provide immediate release of the drug with little or no control over delivery rate. To achieve and maintain therapeutically effective plasma concentrations, several doses are needed daily, which may cause significant fluctuations in plasma levels Because of these fluctuations in drug plasma levels, the drug level could fall below the minimum effective concentration (MEC) or exceed the minimum toxic concentration (MTC). Such fluctuations result in unwanted side effects or lack of intended therapeutic benefit to the patient.

Material and Methods:

Preformulation Studies:
Preformulation testing is an investigation of physical and chemical properties of a drug substance alone and when combined with Excipients. It is the first step in the rational development of dosage forms.

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Objective
The overall objective of preformulation testing is to generate information useful to the formulation in developing stable and bioavailable dosage forms with optimum Dissolution Profile.

Scope
The use of preformulation parameters maximizes the chances in formulating an acceptable, safe, efficacious and stable product.
Preformulation Studies:
Raw material analysis was done as per BP 2010. The Identification test were conducted for Rosuvastatin calcium is appearance, solubility, infrared spectrum, pH, Heavy metal, loss on drying, assay and sulphated ash.

Drug-Excipients Compatibility Studies:
In the tablet dosage form the drug is in intimate contact with one or more Excipients; the latter could affect the stability of the drug. Knowledge of drug- Excipients interactions is therefore very useful to the formulator in selecting appropriate Excipients. This information may be present for known drugs. For new drugs or new Excipients, the preformulation scientist must generate the needed information.

Procedure:
Physical observation
Active ingredient mixed well with all Excipients in binary ratio and small portion of this mixed powder in cleaned and dried vial in stability chamber at $40^{o}C \pm 2^{o}C$ / 75 ± 5% RH and $30^{o}C \pm 2^{o}C$ / 65± 5% RH. Physical observation has been carried out visually for 15 days and 30 days.

FT-IR Studies
Physical compatibility studies were assured by FT-IR studies. The IR spectrums of the mixed powders were taken by preparing Potassium bromide pellets under dry condition by using pellet press. The transmission minima (absorption maxima) in the spectra obtained with the sample corresponded in position and relative size to those in the spectrum obtained with the working / reference standards.

Stability Studies of selected formulations:
Stability of a drug has been defined as the ability of a particular formulation, in a specific container, to remain within its physical, chemical, therapeutics and toxicological specifications. The purpose of stability testing is to provide evidence on how the quality of a drug substance or drug product varies with time under the influence of a variety of environmental factors such as temperature, humidity and light, and to establish a retest for the drug substance or a shelf life for the drug product and recommended storage conditions.
Stability studies were conducted for the different formulation. The storage conditions used for stability studies were accelerated condition (40°C±2°C/75%±5%RH). Sample of tablets were analyzed after 1 month for physical characters, assay, followed by in vitro dissolution test.

Test Performed:
1. Test for physical parameters (description, weight variation, friability).
2. *In vitro* Dissolution Study

List of Materials Used in the Formulation:

Table: 1 Rosuvastatin Calcium Immediate Release Formula

INGREDIENTS *	F1	F2	F3	F4	F5
Rosuvastatin Calcium	11.43	11.43	11.43	11.43	11.43
Dibasic Ca. Phosphate	--------	--------	--------	26.00	26.00
Lactose (Monohydrate)	31.52	29.29	28.86	15.86	14.66
Sod. Starch Glycollate	--------	--------	4.43	4.43	4.43
Microcrystalline Cellulose	39.39	28.79	27.79	14.79	14.66
Hydroxy Propyle Cellulose	0.50	1.33	1.33	1.33	1.33
Iso Propyl Alcohol	q.s	q.s	q.s	q.s	q.s
Magnesium Stearate	0.73	0.73	0.73	0.73	0.73
Talc BP	1.33	1.33	1.33	1.33	1.33
Sod. Starch Glycollate	2.00	5.00	2.00	2.00	2.00
Colloidal Silicon Dioxide	0.40	0.40	0.40	0.40	0.40
Cross Povidone	--------	--------	--------	--------	1.33
Average weight	78.30	78.30	78.30	78.30	78.30

Results and Discussion
Preformulation studies
Preformulation studies are needed to ensure the development of a stable as well therapeutically effective and safe dosage form. It is a stage of development during which the physical pharmacist characterize the physicochemical properties of drug substances and its interaction with various formulation components.

The process variables that could affect the physical characteristics of formulation vis-à-vis in vitro release profile and in vivo drug absorption are optimized during the preformulation studies. Thus preformulation studies in the phase of development decide about the formulation conditions related to process variation and selection of compatible ingredients with their quantities. Additionally physical character of drug and delivery systems enables a pharmaceutical scientist to explain the mechanistic involvement in drug delivery from such system.

Raw Material Analysis of Rosuvastatin Calcium BP

Raw material analysis of Rosuvastatin Calcium was done as per BP including the identification test carried out by the Fourier Transform Infra-red spectrophotometer (FTIR), Appearance, Solubility. Assay, Loss of drying, Heavy metal and sulphated ash reports as shown in table no 2.

Table no.: 2 Identification Test for Rosuvastatin calcium BP

Test	Rosuvastatin Calcium	
	Specification	Observation
Physical appearance	White to off white, crystalline powder	White crystalline powder
Taste	Bitter	Bitter
Odour	Nil	Nil
Infra-red spectra	Sample IR spectrum should comply with standard IR spectrum	Sample IR spectrum complies with standard IR spectrum
Solubility	Poor soluble in water,1.23 mg/ml(pH 6.0)	Poor soluble and 1.25mg/ml (pH 6.0)
Heavy metals	NMT 20 ppm	NMT 20 ppm
Sulphated ash	NMT 0.1%	NMT 0.1%
Loss on drying	2-5%	2-5%
Assay	90-110%	98.66%

From the above data it showed that identified sample drugs are Rosuvastatin calcium.

Drug – Excipients Compatibility Study

The physical compatibility test between the drug and tablet components was carried out at 30^0C±2°C/65%±5% RH and 40°C±2°C/75±5% RH for 15 days and 30 days. The mixture does not show any visible change, thus indicating drug and other tablet components do not have any physical incompatibility report were shown in Table 3.

Table: 3 Physical Observations for Rosuvastatin Calcium

SL No	Drug + Excipients	Parameter	Initial Value of Parameter	Condition RT40°C±2°C/75% ±5%RH		Comments
				15 days	30 days	
1	Rosuvastatin Calcium	Any colour change	No colour change	No colour change	No colour change	Compatible
2	Rosuvastatin Calcium + Sod Starch Glycollate	Any colour change	No colour change	No colour change	No colour change	Compatible
3	Rosuvastatin Calcium + H.P.C.	Any colour change	No colour change	No colour change	No colour change	Compatible
4	Rosuvastatin calcium + Colloidal silicon dioxide	Any colour change	No colour change	No colour change	No colour change	Compatible
5	Rosuvastatin calcium + Cross Povidone	Any colour change	No colour change	No colour change	No colour change	Compatible

FT-IR STUDIES

Rosuvastatin Calcium:

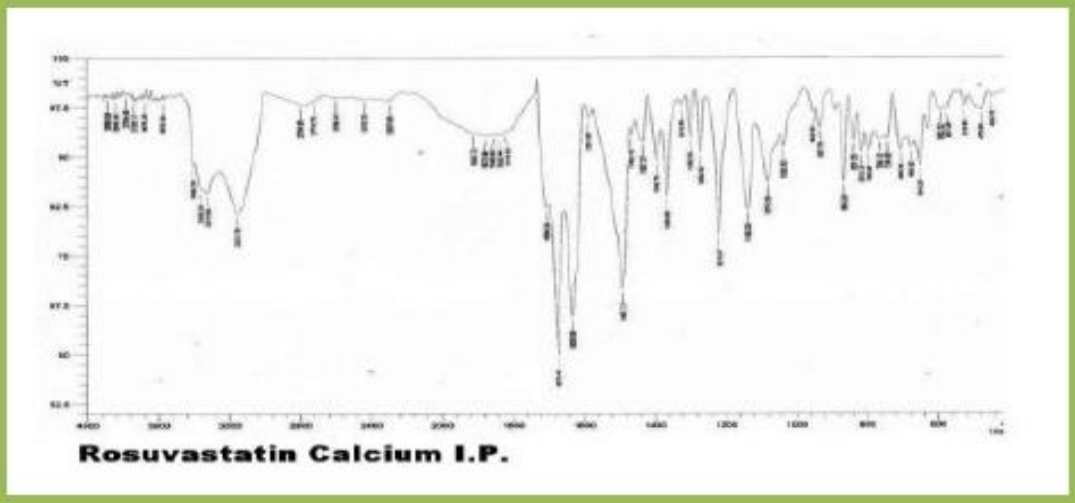

Fig. no.:1 IR Spectrum of Rosuvastatin Calcium

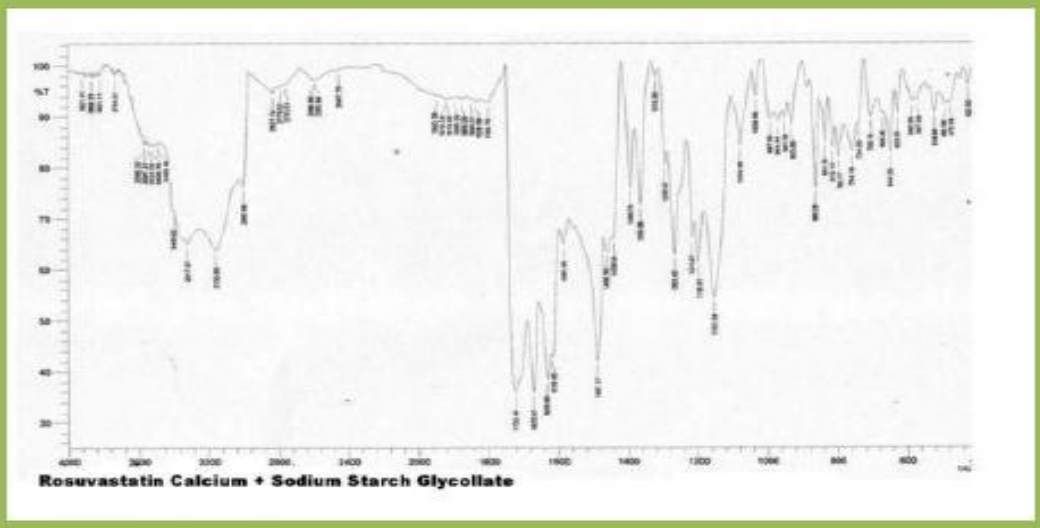

Fig.no.: 2 IR Spectrum of Physical Mixture (Rosuvastatin Calcium + Sodium Starch Glycollate

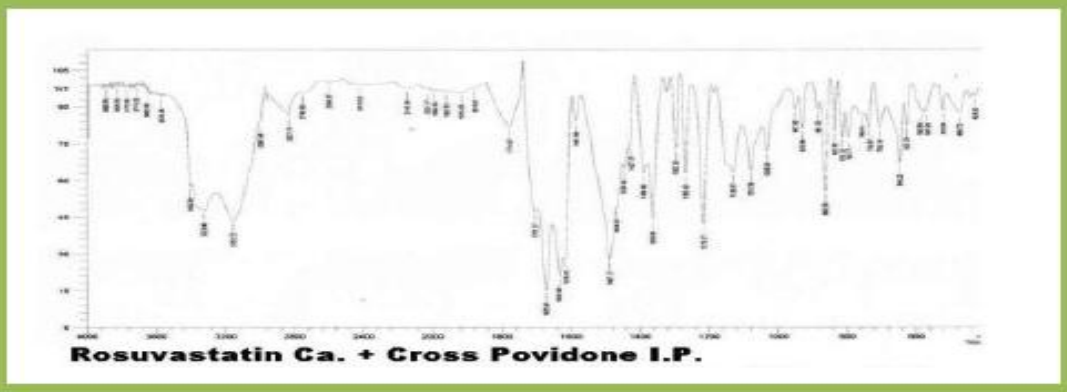

Fig.no:3 IR Spectrum of Physical Mixture (Rosuvastatin calcium BP + Cross Povidone BP)

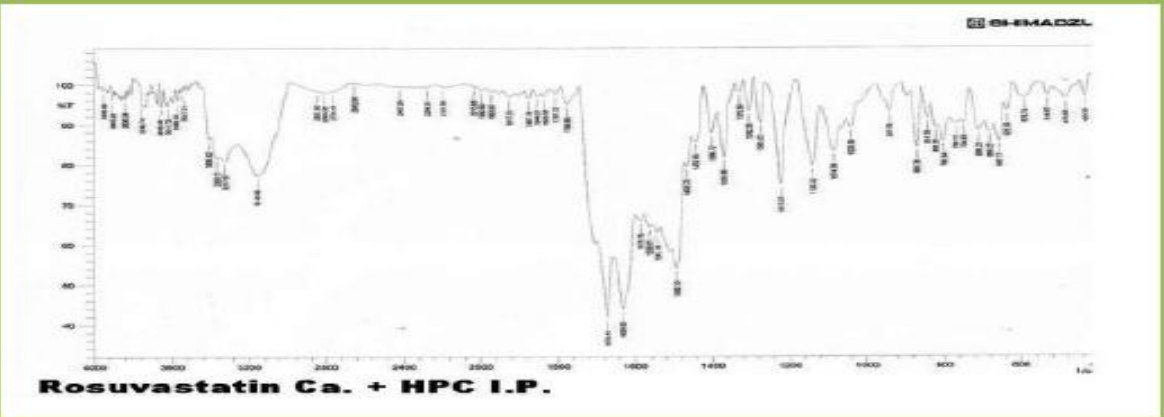

Fig. no. : 4 IR Spectrum of Physical Mixture (Rosuvastatin Calcium+ Hydroxy Propyle Cellulose BP)

The results of IR spectra of active ingredient and Excipientss also revealed that there was no considerable change observed in bands of Rosuvastatin calcium. This shows the absence of any interaction between the drug, polymer and Excipientss used in the tablet.

Evaluation of Granules

Bulk density and tapped density for Rosuvastatin calcium immediate release granules were found to be between 0.604 to 0.662 and 0.688 to 0.646 respectively. Carr's index and Hausner's ratio were obtained in the range of 3.77% to 7.31% and 1.04 to 1.08 respectively. Angle of repose was observed in the range of 16°85′ to 17°41′.In sieve analysis was observed that coarse particle 6.7% to 13% and fine particle 87% to 92.3 % there.

Tab No: 4 Evaluations of Granules

PARAMETERS	AF1	AF2	AF3	AF4	AF5
Bulk Density (g/ml)*	0.662 ± 0.002	0.656 ± 0.018	0.649 ± 0.020	0.642± 0.001	0.618 ± 0.017
Tapped Density (g/ml)*	0.688 ± 0.044	0.688 ± 0.012	0.681 ± 0.001	0.680 ± 0.015	0.655 ± 0.015
Carr's Index (%)	3.77%	4.65%	4.69%	5.58%	5.64%
Hausner Ratio	1.04	1.05	1.05	1.06	1.06
Angle of Repose (degree)	16.85°	16.89°	16.98°	17.04°	17.12°
Sieve Analysis	12% coarse 88% fine	12% coarse 88% fine	11% coarse 89% fine	13% coarse 87% fine	12% coarse 88% fine

* ± Standard deviation

Evaluation of Uncoated Tablets

Tablet of Rosuvastatin was compressed by Rounded shaped punch (upper and lower). Uncoated tablet appeared as white/ yellow colored. The uncoated tablet were evaluated on average weight (limit 76 ± 1% W/W) was found within limit in F1 to F5 (75-77), uniformity of mass (limit ± 3%) was found in between +3.21% to - 3.21% which was within limit, uniformity of dosage (limit 90-110%) was found 98.3% to 99.7%, thickness (3.6-3.8mm) was measured that 3.6mm to 3.8mm, and width (5.0-5.2mm) was also found within limit in F1 to F5, hardness was found 1.8 to 2.8 kg/cm^2, friability (limit NMT 0.15%) was evaluated that 0.09% -0.13% which is within limit. Hence, after evaluated all the parameter it was found that uncoated tablet is within the limit and uncoated tablet was proceed for coating. The evaluation of uncoated tablet report was shown in following table.

Table no.:5 Evaluations of Uncoated Tablets

PARAMETERS	LIMIT	F1	F2	F3	F4	F5
Appearance	White Coloured Round shaped Uncoated					
Average Weight (mg)	75± 1% W/W	74.2	74.8	75.8	75.5	75.1
Uniformity Of Mass	± 3% from average weight	- 3.45 to +3.63%	-2.91 to +3.36%	- 3.41 to +3.45%	-3.45 to +3.63%	-3.20 to +3.54%
Uniformity Of Dosage	90-110%	98.7%	98.3%	99.2%	98.9%	99.5%
Thickness (mm)*	3.2-3.7	3.4± 3.5	3.2 ± 3.58	3.0± 3.28	3.7± 3.9	3.4± 3.6
Width (mm)	4.8- 5.1	4.99	5.05	5.10	5.07	5.03
Hardness (kg/cm^2)*	2- 3.5	2.5 ± 1	2.7 ± 0.77	2.9 ± 0.57	2.4 ± 1	2 ± 0.79
Friability (%)	NMT 0.15%	0.1	0.09	0.12	0.11	0.13

Evaluation of Coated Tablets:

Coated tablet of Rosuvastatin was appeared as pink colored, rounded shaped. The coated tablet were evaluated on average weight (limit 77 ± 1% W/W) was found within limit in F1 to F5 (75-77), uniformity of mass (limit ± 3%) was found in between +3.21% to - 3.21% which was within limit, uniformity of dosage (limit 90-110%) was found 98.3% to 99.7%, thickness (3.6-3.8mm) was measured that 3.6mm to 3.9mm, and width (5.0-5.4mm) was also found within limit in F1 to F5, hardness was found 1.8 to 2.8 kg/cm^2,Related substance(limit individual impurities NMT 1.0% and total impurities NMT 2.0%) was found for individual impurities 0.04% to 0.12% and for total impurities 0.24% to 0.82%, Hence, after evaluated all the parameter it was found that coated tablet is within the limit and coated tablet was proceed for packaging. The evaluation of coated tablet report was shown in following table.

Table no. : 6 Evaluation of Coated Tablet

PARAMETERS	LIMIT	F1	F2	F3	F4	F5
Appearance	White / Pink Coloured, Rounded Shaped, Film Coated					
Average Weight (mg)	80 ± 1%w/w	77.7	77.8	77.6	77.7	77.9
Uniformity Of Mass	± 3% from average weight	-3.15 to +3.25%	-3.11 to +3.29%	-3.22 to +3.20%	-3.09 to +3.18%	-3.20 to +3.20%
Uniformity Of Dosage	90-110%	98.7%	98.3%	99.2%	98.9%	99.5%
Thickness (mm)*	3.75-3.82	3.76 ± 0.15	3.78 ± 0.15	3.69 ± 0.20	3.75 ± 0.25	3.77± 0.15
Width (mm)	5.00- 5.12	5.02	4.95	5.06	5.11	5.03
Hardness (kg/cm$^{2)*}$	2-3.2	2.9 ± 1.0	2.5± 1.15	2.3 ± 1.0	2.4± 1.0	2.0 ± 1.0
Related Substance (i) individual impurities (ii) total impurities	(i) NMT 1.0% (ii) NMT 2.0%	(i) 0.08% (ii)0.55%	(i) 0.04% (ii)0.48%	(i) 0.09% (ii)0.58%	(i) 0.12% (ii)0.82%	(i) 0.05% (ii)0.40%
Assay Each film coated tablet contain Rosuvastatin (mg)	15.0-17.9 (98-110%)	15.31 (85.10%)	16.41 (89.3%)	16.98 (93.6%)	17.50 (95.54%)	17.87 (98.9%)

In Vitro Dissolution profile:

The immediate release of Rosuvastatin was designed with the dose of 77.9 mg. The granules were prepared by wet granulation method using HPC as a dissolution enhancer. Sodium starch glycollate was used as a super disintegrant for immediate release layer. In AF1 Formulation, Rosuvastatin Calcium (11.43mg) as API and Lactose monohydrate 31.52 mg, HPC 0.5mg, Microcrystalline Cellulose 30.39 mg, (Adjusted according to the amount of other Excipients) as diluent, sodium starch glycollate 2.00 as simple disintegrant were taken in dry mixing, colloidal silicon di oxide as simple also disintegrant were taken in dry mixing . And Talc 1.33mg was used in prelubrication. Magnesium stearate 0.73mg was used as lubricant in formulation. In dissolution profile study of AF1 was observed that, In 30 min its release (40.10%) was lower than the specification. Variation in Rosuvastatin calcium Formulation was according the dissolution profile obtained within limit or not. In AF2 Formulation, amount of sodium starch glycollate was increased upto 6.5% and other Excipients were in same percentage as AF1. In dissolution profile study of AF2 was observed that, In 30 min it's release (58.43%) was lower than the specification. In AF3 Formulation, sodium starch glycollate additional 11.29% was added as dissolution enhancer in wet granulation process and other Excipients were in same percentage as AF2 but sodium starch glycollate decrees up to 2.55% at the time of lubrication. In dissolution profile

study of AF3 was observed that, In 30 min it's release (79.46%) was lower than target release. In AF4 Formulation, Stabilizing agent added Dibasic Ca. Phosphate amount was increased up to 33.00% and other Excipients were in same % as AF3. In dissolution profile study of AF3 was observed that, In 30 min it's release (85.54%) was lower than target release. In AF5 Formulation, It is optimized formulation in which additional Excipients Cross Povidone after granulation mix with granules up to 1.69% to enhance the disintegration property and other Excipients were in same % as AF4..In dissolution profile study of AF5 was observed that, In 30 min it's release (90.09%) was similar to target release and final formula was established.

Table no.:7 Rosuvastatin Immediate Release Dissolution Profile

LIMIT	% RELEASE ± % RSD				
	AF 1	AF 2	AF 3	AF 4	AF 5
NLT 75% of labelled amount in dissolution media within 45 min.	40.10 ± 0.87%	58.43 ± 0.35%	79.46 ± 0.74%	85.54 ± 0.66%	90.09 ± 0.40%

Where, All the values are means ± RSD, n = 6

Summary & Conclusion

The present investigation, an attempt has been made to design Immediate Release. Tablets of Rosuvastatin Ca., by using Sodium starch Glycollate as Super-Disintegrent and Dibasic-Calcium Phosphate used as a stabilizing agent for therapy associated with anti-hyper-lipidemic. The tablets were prepared by wet granulation technique. The physical compatibility evaluation was performed in visual basic and FT-IR. The study revealed that the drug, Superdisintegrants, Stabilizing Agents and other Excipients were physically compatible with each other as there was no change of physical description. Infra Red spectrum of Rosuvastatin matches with the standard spectrum as well as there was not any additional peak formation with the Excipients. Preformulation studies were carried out, the organoleptic properties were complied with the Pharmacopoeial specification. Physical properties such as bulk density and tapped density, angle of repose, carr's index, hausner's ratio were within the in house tentative specification. Sieve analysis and melting point determination were indicate the particle size distribution, purity of the drug powder and Loss on drying ware within the limits. Assay of Rosuvastatin Ca. was carried out by HPLC method and was found to be 98.9%. All the formulations were evaluated on the basis of pharmacopoeial specifications. Shape of the tablets was rounded, hardness, thickness, weight variation, and in-vitro Dissolution test were carried out. It indicate the tablets were within the limits. Stability studies of the selected formulated tablets were carried out by in stability chambers at 40˚C + 2˚C/ 75 + 5 % RH for 30 days. All the parameters were within the limit after 30 days. In vitro release rate were fitted to Korsmeyer-peppas model. The F5 formulation thus exhibited anomalous (non Fickian) diffusion mechanism. The drug release was diffusion controlled as plot of higuchi's model was found not to be linear. These formulations also showed highest R^2 values of first order kinetics indicating the amount of drug from the matrix system were by both diffusion and erosion.

Formulation-F5 containing 10 mg of Rosuvastatin Ca per tablet and developed employing Dibasic Ca. Phosphate 26 mg, Latose Monohydrate 14.66 mg, Sod. Starch Glycollate 4.43 during granulation & 2.00 mg during lubrication, MCC 14.66 mg, Hydroxy Propyle Cellulose 1.33 mg, Magnesium Stearate 0.73 mg, Colloidal Silicon Dioxide 0.40 mg, Cross Povidone 1.33 mg and show better in all physical and chemical tablets properties and dissolution rate from other formulations. No significant change was observed in the drug content, physical properties and dissolution rate of these tablets after the storage period of one month at 40o c and 75%RH.Hence the study resulted in the development of Rosuvastatin Ca. Immediate release tablets comparable to the other formulation and fulfilling the all objective of the study. Hance, it can be concluded that the formulation (F5), Rosuvastatin Ca. immediate release tablets were better in all the parameter including percentage drug release when compare to the other formulations.

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THE END

ARTICLE

3

Biodegradable Polymers

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Abstract:
Biodegradable polymers are the polymers that can be broken down by human microflora or other simple organism. Biodegradable polymers are of basically two types, Natural & Synthetic.
In natural, polymers used examples are gelatin, collagen, albumin etc. They have so many applications like confocal microscopy and albumin penetration into contact lenses, ph responsive quantum dots by an albumin polymer surface coating, nonviral gene delivery. Gelatin has number of applications. Synthetic biodegradable polymer have many applications like bone replacement, tissue engineering, general and reconstructive surgery with synthetic biodegradable polymer etc. Some other biodegradable polymers which have the application such as Lactide\glyolide polymer are presently the most extensively investigated biodegradable. Since the wide range of biodegradable profile available with Lactide\glyolide polymer, duration of action of drug delivery products ranges from a few days to 5 years. Polyanhydride are a class of biodegradable polymer characterized by anhydric bond that connect repeat units of the polymer backbone chain. Polycaprolactone (PCL) is biodegradable polyester with a low melting point of around 60°C and a glass transition temperature of about −60°C. PCL is prepared by ring opening polymerization of ε-caprolactone using a catalyst such as stannous octanoate. The most common use of Polycaprolactone is in the manufacture of specialty polyurethanes. Polycaprolactone (PCL) reveals good oil, water, solvent and chlorine resistant to the polyurethanes products. The pharmaceutical composition may be in the form of topical, syringable, and inject able formulation for local controlled delivery of the active agent.

Introduction

Biodegradable polymers are the polymers that can be broken down by human microflora or other simple organism Biodegradable polymers can be classified in three groups depending on their origin;

1) Microbial
2) Naturally occurring polymers
a) Animal origin
b) Marine origin
c) Agricultural feedstock
3) **Synthetic biodegradable polymers**
Examples;
Naturally occurring polymers
1) Proteins; albumin, collagen,
2) Polysaccharide; starch, hyaluronic acid, dextran, alginic acid, xanthun gum, guar gum, rosin , insulin, pectin, amylase, cyclodextrin.
Synthetic biodegradable polymers;
1) Polymers with hydrolysate backbone;
2) Aliphatic polyesters; polyesters derived from diacids & diols.Monomers with both an acid & alcohol group. Poly (ester) amides, Polyurethanes, Polyanhydrides.

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2.1 Naturally Occuring Biodegradable Polymers

2.1.1 Albumin

Albumin is a major plasma protein constituent according to 35.5% of the total protein. Since they were first described by KRANER albumin micro sphere have been extensively investigated in controlled release system as vehicle for the delivery of therapeutic agents to local sites. Albumin has non-antigenic property & ability to control the physiochemical characteristic of the micro sphere produced, depending on the cross linking methods & characteristics of cross linking agents.

2.1.2 Gelatin

Gelatin is obtained from partial hydrolysis of collage nous animal tissue, which converts the tough fibrous collagen into an unoriented water soluble protein. Gelatin is used as a coating material for micro capsulate. This is used to bring chemotherapeutic agents like mitomycin C, Adriamycin, 5-fluorouracil & biomycin man-made from emulsification & desolvation technique. Gelatin can be used in controlled & release dosage from micro pellets 0.4 to 1.5 mm in diameter can be formed by spray congealing method.

2.3) Collagen

Collagen is a chief structural protein originates in animal tissues, usually present as associated fibres in tissue like skin and tendon and serves to bound tissue deformation and avoids mechanical failure. It has been used in biomedical field as homeostatic fleece, absorbable sutures, sponge wound dressing, composite tissue tendon allografts, anjectabelor facial reconstructive surgery, and as drug delivery vehicles.

3) Synthetic Biodegradable Polymers

3.1.1. Lactide\Glycolide Dased Drug Delivery System

The LACTIDE \ GLYCOLIDE polymers are currently nearly all broadly investigated biodegradable exceptions for controlled drug delivery.

3.1.2..PLGA-PEG Block Copolymers for Drug Formulations

Freshly, biodegradable polymers, principally poly (lactic acid) (PLA), poly (glycolic acid)

(PGA), and poly (lactic-co-glycolic acid) (PLGA), have been used considerably in pharmaceutical and biomedical applications. Poly (lactic acid), poly (glycolic acid), and poly (lactic-co-glycolic acid) have also been called polylactide, polyglycolide, and poly (lactide-co-glycolide), in that order, according to the nomenclature system based on the basis of the polymer. PLA, PGA, and PLGA can be degraded into non-hazardous substances and detached from the human body. For that reason, they have taken middle.

3.1.3. Polyanhydrides

Polyanhydride are a group of biodegradable polymers classified by anhydride bonds that attach duplicate units of the polymer backbone chain. In vivo, Polyanhydride disintegrate into non-hazardous diacids monomers that can be metabolized and eliminated from the body. Due to their safe degradation products, Polyanhydride are considered to be biocompatible. [17]

3.1.4. Polycaprolactones

Polycaprolactone (PCL) is biodegradable polyester with a low melting point of around 60°C and a glass transition temperature of about −60°C. PCL is organized by ring opening polymerization of ε-caprolactone using a catalyst such as stannous octanoate. The most general use of Polycaprolactone is in the creation of specialty polyurethanes. Polycaprolactone disclose better water, oil, solvent and chlorine resistance to the polyurethane formed.

3.1.5 Poly (Ortho-Ester)

Poly (ortho esters) has evolved from side to side four families, chosen as POE I, POE II, POE III and POE IV. POE IV has been exposed to have all the essential attributes to permit commercialization and such hard work is at present happening. Leading amongst these attributes is synthesis adaptability that allows the facile and reproducible manufacture of polymers having the preferred mechanical and thermal properties as well as beloved erosion rates and drug release rates that can be diverse from a few days to many months. Supplementary, the polymer is constant at room temperature when stored under anhydrous conditions and undergoes an erosion process curbed principally to the surface layers. Significant consequences of surface erosion are controlled and concomitant drug release as well as the preservation of a fundamentally neutral Ph in the center of the matrix since acidic hydrolysis products disperses away from the device. Two physical forms of such polymers are beneath development. One form, solid materials, can be made-up into shapes such as wafers, strands, or microspheres. The other form is inject able semi-solid materials that permit drug integration by a easy mixing at room temperature and devoid of the use of solvents.

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3.1.6. Polyphosphazenes

Polyphosphazenes are characteristically organised by the thermal ring-opening polymerization of hexachlorophosphazene $(Cl2PN)_3$ followed by esterification of the intermediary poly(dichlorophosphazene) with either amines or sodium salts of alcohols.

3.1.7. Pseudopoly (Amino Acid)

Tyrosine-derived poly (amino acids) designed for biomedical polycarbonates: modified "pseudo"- applications; Preliminary from L-tyrosine (Tyr) and its metabolites desaminotyrosine (Dat) and tyramine (Tym), four structurally connected model dipeptides were organized, Dat-Tym (neither N- or C-terminus present), Z-Tyr-Tym (N-terminus confined by benzyloxycarbony), Dat-Tyr-Hex (C-terminus confined by a hexyl ester group), and Z-Tyr-Tyr-Hex (both N- and C-termini present, secluded by benzyloxycarbony and hexyl ester, correspondingly). The model dipeptides were used as monomers in the production of polycarbonates. The polymerization reaction in the occurrence of either phosgene or triphosgene proceeded using the phenolic hydroxyl groups.

3.1.8. POLY (α-amino acid)—Drug Conjugates

4.1. A Biodegradable Inject able Drug Delivery System;

Bioactive agents, an opium antagonist and the two antihypertensive drugs, have been covalently coupled to biodegradable polymers. Carbamate and carbonate bonds were engaged as legally responsible linkage between drug and polymer backbone. In- vitro release researches for poly (hydroxypropylglutamine)(PHPG)-prazosin conjugate particles gave 3 weak stable release and poly (hydroxypropylglutamine-co-leucine) [P{HPG\LEU}]-NALTREXONE conjugates with a variety of particle size showed that the release rate increases with decreasing particle size. In-vitro studies were consummate in male Nee Zealand at the same time as rabbits and female Sprague-daweley rats by injection of the poly (alpha-amino acid) conjugate subcutaneously. On an early rupture almost steady drug plasma levels, were achieved for 2 weak for the PHPG-prazosin conjugate and 30 days for p (HPG\LEU)-naltrexone conjugates.

4.2. Biodegradable Polymers in Controlled Drug Delivery

There are three most important mechanisms by which active agents can be released from a delivery system: diffusion, degradation, and swelling followed by diffusion. All of these mechanisms may happen in a given release system. Diffusion occurs when a drug or other active agent passes from beginning to end the polymer that forms the controlled- release device. The diffusion can happen on a macroscopic scale—as through pores in the polymer matrix—or on a molecular level, by passing between polymer chains. Examples of diffusion-release[24]

One of the most extraordinary, and functional, features of a polymer's swelling capacity manifests itself when that swelling can be triggered by a change in the environment surrounding the delivery system. Depending upon the polymer, the environmental adjust can occupy pH, temperature, or ionic strength, and the system can either shrink or swell upon a change in any of these environmental factors.

4.3. Biodegradable Polymer Used in Transdermal Drug Delivery

Micro needle collection with biodegradable tips procedure has been developed to manufacture micro needles with macro porous tips. The macro porous silicon is noticeable as biodegradable material. Consequently, it has gorgeous probable application in biological area. Furthermore, the permeable structure provides an alternated technique for drug loading.

4.3.1 Rosin:

Application of rosin in pharmaceutical and medical fields: Rosin has been used to prepare spherical Microcapsules by a technique based on phase separation by solvent evaporation. Rosin based polymer has been used as film coating materials; coated pellets were ready by means of diclofenac sodium as a model drug and sustained release of the drug was achieved. Rosin polymer has used as the transdermal drug delivery system.

4.4 New biodegradable polymers for inject able drug delivery systems

Many biodegradable polymers were used for drug delivery and some are flourishing for human application. There rest manufactures problems, such as difficult process ability33 and incomplete organic solvent and for a polymer consequent from condensation of polyisocyanates and poly-ols having an intermolecular urethane bond or carbamate ester bonds. The polyurethanes synthesize from polyether polyol are termed polyether urethanes, and those synthesized from polyester polyol are termed polyester urethanes. even though most polyurethanes presently used are of the polyether type because of their high resistance to hydrolysis, polyester polyurethanes recently have become the focus of attention because of their biodegradability. These polyester or polyether urethanes are rubbery and relatively permeable. The hydrophilic–hydrophobic ratio in these polymers can be balanced to get the optimum permeability properties. Polyurethane membranes are suitable especially for hydrophilic polar compounds having low permeability through hydrophobic polymers such as silicone rubber or EVA membrane.

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4

TRADITIONAL TREATMENT OF LEUCODERMA BY RURAL AND TRIBLAS PEOPLE'S OF GWALIOR-CHAMBAL REGION, INDIA

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Abstract:

A large number of plants/ plant extracts/decoctions pastes are equally used by tribal's and rural people in Gwalior Chambal regionM.P. India for treatment of Leucoderma, This work, ethnomedicinal information on 1 0 plant species belonging to 07 families was documeted interrogating the traditional practitioners. Concerned scientific names along with their family, vernacular names, parts used, disease cured by these plants have been discussed in this paper

Introduction

WHO has estimated that at least 80% of the population globally relies on traditional medicine to meet their primary health care needs (Bannerman1982[1];WHO,2000[14]) Leucoderma is a chronic disorder of the skin where the skin stops producing pigments that color the skin.

As a result white patches appear randomly at different locations on the skin. These patches are white in color and as time passes may increarse in number and size. Leucoderma is not a medical term. It is only a substitute name for vitiligo

The Skin is colored in different shades of brown due to a pigment called melanin Special cells called melanocytes are responsible for the production of melanin. Sometimes, for reasons dubious, the melanocytes stop producing melanin which results in white skin patches. Skin disease leucoderma are common occurrence among the rural masses due to poor hygienic conditions,poor sanitation facility and cold contaminated water . Traditional herbal medicines used by Tribals and Rural people's communities play an important role in alleviating such skin disease(Leucoderma).They are safe,effective and inexpensive and in many cases ,the only method of medication About 0.5% to 2% of the worlds population currently suffer from leucoderma. Leucoderma or vitiligo is an idiopathic acquired disorder of skin. Patients with vitiligo develop white spots in the skin with varying size and location. The world wide incidence of leucoderma has been reported 1-2%. In India, its incidence is around 4-5% in some parts of Rajasthan and Gujarat it is very high more than 5-8%. This skin disorder is considered as social stigma in our country and people confuse it with leprosy Leucoderma is not a contagiuos disease so there is no way a person can have leucoderma just by being around another person having it. Even though this is a proven fact, patients suffering from leucoderma often aren't accepted well in the social world. This often results in the patients suffering from depressive disorders Leucoderma is not a contagious disease it does not spread by touching or eating with the person suffering from Leucoderma.. This practice is highly discouraged. Leucoderma patients should not be stigmatized or isolated because of their diseased condition for this is insensitive and in human. Leucoderma patients are normal people like us having the same abilities as we do or even more. In fact they are us. Leucoderma may or may not be congenital. As this disease is little understood, nothing can be said about it with certainty. Parents having Leucoderma are more likely to give birth to babies suffering f rom Lekoderma, however, this does not mean that a Leucoderma parent will always give birth to a Leucoderma baby. Similarly if one member of a family has Vitiligo, it does not necessarily mean that others will suffer from it or catch it. There are about 65 million people world wide those have the vitiligo, including 1 up to 2 million in the United States. It is very amazing that, there are only few people, outside medical professionals and those who suffered with this disease, had heard about the term "vitiligo". It is very typical disease. **Michael Jackson** stated that he was diagnosed with **vitiligo in 1986**. In a 90-minute interview with Oprah Winfrey **in February 1993**, and **Amitabh Bacchan** is a man who needs no introduction in India or even abroad. He is at the age of sixty plus and is a super film actor of India. He is a greater icon of bollywood He is also suffered with **vitiligo in 2005-06** [10] Ethnomedicinal survey was conducted in Gwalior- Chambal parts of Madhya Pradesh a number of valuable data on the uses of indigenous medicinal plants were recorded(Bhalla et,al 1986)[2]

Gwalior is located at 26.22°N 78.18°E- It has an average elevation of 197 metres (646 feet). Gwalior is anhistoric Indian city located on the periphery of Madhya Pradesh Stand, 300 km (186 Miles) from Delhi.Gwalior has a population of 1,053,505. Males constitute 53% of the population and females 47%. Gwalior has an average literacy rate of 85.20%, higher than the national average of 74%: male literacy is 90.85%, and female literacy is 78.82%. In Gwalior, 13% of the population is under 6 years of age. Use of traditional medicine has changed dramatically over the years, due to its affordability, availability, accessibility and acceptability (WHO,2008) [15]

Causes;

As mentioned above, the reason for leucoderma is still not very clear. However some theories are present and are as follows The first and most supported theory is autoimmune. In this case, the bodies self defense mechanism mistakes the melanocytes as foreign particles and destroys them thus putting melanin production to a halt. There is evidence that points towards this theory and tests are being carried out to determine if this is accurate and how to stop this. cause of nerve damage. This can also be true as in a type of leucoderma called as segmental vitiligo, the areas of skin affected are often the areas in contact with the dorsal root of the spinal chord. system of the body is, for an unknown reason, disturbed resulting in loss of melanocytes. A third theory is

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more based on statistical data than research. Statistics suggest that if a parent has leucoderma, his/her child will have a higher risk of having leucoderma than the rest of the population. So this theory suggests that a genetic factor is present in the causes of this disease. A fourth theory suggests that leucoderma is a direct cause of nerve damage.

Materials and Method;

Regular field trips were conducted during the period from November 2011 November- 2012 in different places of Gwalior Chambal region .During the trips, contacts were made with the villages heads ,herbal practioner as well as elderly men and women of the tribal's and riral communities. Prior informed consent was obtained from the village ,Hakims. vaidhyas, Gunias and Ojhas, Information on medicinal plans and treatments leucoderma diseases was gathered though conservation ,interviews and discussion For this a questioner was designed for interviewing the participate of tribal's communities During the fieldwork, repeated verification of data by different informants a at different places was carried out. Only the specific and reliable information crosschecked with different informants and at different places was incorporated in the present study. Only information that was obtained from at least two participants has been documented here. The information gathered was also crosschecked with available literature of Madhya Pradesh Jain, 1962[3]. Bhalla,1986[2] Jain, 1988 [4] Maheshwari, 1990[8]. Singh,1993[9] Sikarwar, 1998[12]. Jain, and Patole,. 2001[5] Samvatsar, and Diwanji, . 2004[13] Jain, A.K.and Vairale, 2007 [6] Voucher specimens were deposited in the herbaria of the Department of Botany Bengir college & Research center,Bhopal,M.P. The recorded plant species were alphabetically arranged followed by voucher specimen along with their families, local names Mode of administrative and use

1 *ABRUS PRECATORIUS*- Local Name-Gunja, Family- Fabaceae Part Use-Root ;Use-1 Root paste is applied to cure leucoderma,

2 *AZADIRACHTA INDICA*-Local Name- Neem Family- Meliaceae , Part used-whole Plans ; Use-1 Neem has excellent proven qualities for treating skin diseases including Leucoderma. For this, you can either go for Neem leaves juice or can go for ready made Neem extracted capsules. This is one of the best traditional remedies for leucoderma Neem is extremely effective in treating leucoderma. Attempt to drink a glass of neem juice everyday. 3.*Chenopodium*- Local Name- Goosefoots Family- Amaranthaceae Part Use-Leaf Use-1 Dry pomegranate leaves in shade and grind them into fine powder. Sieve it and take about eight gm every morning and evening with fresh water. Leucoderma treatment using Goose Foot

4 The use of goose foot is helpful in the treatment of this disease. This vegetable should be taken two times daily in the morning as well as in the evening, for two months incessantly. Simultaneously, the juice of the leaves should be practical over the patches of leucoderma 4. *Cucumis sativus* - Local Name- Kheera Family -Cucurbitaceae.Parts use- creeper Use-1 Combine 100 gm each of alfalfa and cucumber juice. Consume this mixture two times a day . in the morning and evening. This is a useful home remedy for treating leucoderma. Take a handful of dry pomegranate leaves and grind them into a fine powder. Have about 8 grams of this powder every morning and evening, with glass of water

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5. *CURCUMA LONGA*- local Name—Haldi- Family Zingibaraceae –1 You can also make poultice of ginger leaves and apply it on the affected area. The patches usually start getting healed up to certain extent. This is one of the effective and useful for leucoderma 2 The Turmeric mixed with mustard oil has also proved useful in leucoderma. About 500 gm of turmeric should be pounded and soaked in 8 litres of water at night. It should be boiled in the morning till only one litre of water is left, and then be strained and mixed with 500 ml of mustard oil. This combination should be heated till only the oil is left. It should then be strained and preserved in a bottle. The combination should be applied on the white patches each morning and evening for Leucoderma.,

6.*GLYCORRHIZA GLABRA*- Linn Local Name- Family-Fabaceae Part Use-Stem Use-1 Past of stem alongwith withania somnifera roots is applied on the affected parts continuously for one years to cure leucoderma

7 *MEDICAGO SATIVA*- Local Name-Alfalfa, Family- Fabaceae Part Use- flower ;Use-1 The combination of 100 gm of drug alfalfa and cucumber juice has beneficial effects on Leucoderma. Consume this mixture twice a day. This is one of the simple and effective remedies for leucoderma

8 .*OCIMUM TENUIFLORUM*- Local Name- Tulsi, Family -Lamiaceae , Part Use- leaf Use-1 plays an important role in treating leucoderma. For this, one can consume raw leaves of holy basil or can go for the decoction made out of the stems and leaves. Tulasi 2Holy basil leaves prove to be beneficial in treating white patches. Consume raw basil leaves or make a decoction out of Holy basil's leaves and stem, along with water

9. PSORALEA CORYLIAFOLIA. –Local Name-Bakuchi Family-Fabaceae Herb Use- Herb 1 Soak psoralea seeds in ginger juice for 3 days. Thereafter, dry them and grind to make a fine powder. Have 1 gram of this powder, with a glass of milk, for about a month. You can also apply this powder on white patches.2 Another method would be to soak psoralea and tamarind seeds in water for 3-4 days. Dry them well and grind to form a paste. Apply this paste on the affected area on a daily basis. 3 The best-know home remedy for leucoderma is the employ of seeds of psoralea (babchi). These seeds should be steeped in the juice of ginger for three days. The fluid should be renewed each day. The seeds should then be rubbed with the hands to remove the husks, dried in the shade and powdered. One gram of this powder should be taken each day with one cup of

fresh milk for forty days incessantly. 4 The ground seeds should also be applied to the white spots. Babchi seeds, combined with tamarind (tamarind) seeds are also useful. A same quantity of both the seeds should be steeped in water for three to four days. They should then be shelled and dried in the shade. They should be ground into paste and applied to the white patches for a week. If the application of this paste causes itching, or the white spots become red and a fluid begins to ooze out, this treatment should be discontinued ***10***. *Raphanus sativus* - Local Name-Mooli Family- Brassicaceae- Parts uses Seeds ,Use-1 Take about 25 grams of radish seeds and ground them into a powdery substance.Add 2 tsp vinegar and make a fine paste. Apply this paste on the affected area and wash off when dry. Leucoderrma 2 A paste made from the seeds of the radish is valuable in treating leucoderma. About thirty-five grams of these seeds should be powdered in two teaspoons of vinegar and practical on the white patches In about eight liters of water, soak 500 gm turmeric. Boil the concoction until only a liter of it is left Strain this liquid and add ½ liter mustard oil to it. Apply this on the patchy areas two times a day, for at least 2-3 months

Result & Discussion;

During the investigation .It was found that 10 plants species are used as herbal medicine for treatment of skin disease leucoderma 10 plant species beloging to 6 family Herb-8 plants,Creeper- 1.Tree-1, Family Zingibaraceae1 Family-Fabaceae-4 species family- Meliaceae-1 Family- Amaranthaceae-1 Family - Cucurbitaceae-1, Family - Lamiaceae-1 Family -Lamiaceae-1- Family Zingibaraceae-1 species,Leaf was the most widely used plant part, Most of the harbal remadies werewera taken externally in the form of paste. The plant parts were crushed and made into paste for application over the area of the disease. Only in some cases along with the plant parts a little amount of honey , water milk was used.

Conclusion;

The traditional knowledge on the properties of plants and their uses to treat, leucoderma, skin diseases are increasingly being put to the practice of Ayurvedic medicine. Among 10 plants used by ethnic groups of Gwalior region for treating, leucoderma skin diseases This traditional knowledge will slowly disappear due to lack of proper documentation and awareness.These plants represent a major source for the pharmaceutical industries in view of their raw material. Modern medical facilities are now making a rapid penetration into tribal villages, which may result in the disappearance of the herbal wealth. It is hoped the remaining 11 plants species that this study

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Diet of Leucoderma Patient;

One should avoid junk food, packed food and canned food. This may contain the preservatives which may worsen the case of Leucoderma.Try to avoid stimulating beverages like carbonated cold drink, coffee and tea. These beverages may produce irritation to some type of skins Place a drinking water in copper's vessel overnight. Drink this water early in the morning on empty stomach. Copper has capacity to heal the Leucoderma. Eat walnuts regularly. The walnuts have property to purify the blood. And so is helpful for Leucoderma.

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ARTICLE

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MICROSTRUCTURE, HARDNESS AND WEAR PROPERTIES OF ALUMINUM BASED HYBRID COMPOSITES

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Abstract:

Metal Matrix Composites (MMCs) consist of either pure metal or alloy as the matrix material, while the reinforcement generally a ceramic material. These are important class of design and weight-efficient structural materials that are encouraging every sphere of engineering applications, mainly in aerospace sector. Majority are Aluminum Matrix Composites (AMCs). The key features of AMCs are high specific strength, improved wear resistance, hardness and good thermal conductivity. The present investigation is to form a new class of composite, Al 7075alloy matrix reinforced with E-glass short fibers and fly ash particulates. Different composites were obtained by using stir casting method, varying E-glass with constant fly ash and vice- versa. The MMCs were obtained for the different compositions of E-glass and Fly ash particulates. The microstructures of the composites were studied to know the dispersion of the fly ash and E-glass fibers in the matrix. The test specimens were prepared to the standard size by turning and facing operations to evaluate hardness, wear properties and the specimens are subjected to heat treatment. The results are plotted and it is concluded that the MMCs obtained have got better hardness and wear resistance compared to Aluminum alloy (7075) alone. Further, it was observed that hardness and wear resistance of heat treated composites is higher when compared to as cast composite.

Introduction

Materials are essential part of the engineering industry. An engineer needs materials to give shape to his/her concept and design [1]. In general, materials of high strength will have relatively high density. Materials for aerospace, transportation and structural application should have low density but yet strong and hard. Conventional materials will not posses this unusual combination of prosperities. The mechanical and tribological prosperities of various materials can be improved by forming new class of materials known as composites. A composite material is defined as a structural material formed artificially by combining two or more materials having dissimilar characteristics. A composite is designed to display a combination of the best characteristics of each of the component materials [2]. Metal Matrix Composites (MMCs) consists of either pure metal or an alloy as the matrix material, while the reinforcement generally a ceramic material. Aluminum is the most popular matrix for the metal matrix composites. The Al alloys are quite attractive due to their low density, capability to be strengthened by precipitation, good corrosion resistance, and high thermal and electrical conductivity.

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Aluminum Matrix Composites (AMCs) are the class of light weight high performance materials. The reinforcements in AMCs could be in the form of continuous/discontinuous fibers. Whisker or particulates [4]. In the present investigation fly ash, E-Glass are reinforced with Al 7075 alloy matrix which is a high strength alloy mainly used in aerospace applications. Fly ash is the residue resulting from the combustion of coal in thermal power plants and is one of the inexpensive low dense reinforcement with excellent engineering properties. E-Glass is used as reinforcing phase which has excellent fiber forming capability with all-round good properties.

Experimental Work

The matrix material for this experimental investigation is commercially available aluminum AA7075 in the form of ingots. The reinforcements are fly ash particulates in the range of 0.1 to 100 µm and E-Glass short fibers of length 2 to3 mm .The hybrid composite is formed by stir casting method. An electric arc furnace was used for melting the alloy. The ingots of the alloy were cut into small pieces and were put into the crucible which was preheated and then it was kept for melting in the furnace. Molten metal was heated to 800^0 C. Degassing was carried out by adding chloromethane to remove hydrogen from the molten metal in order to avoid the void formation during solidification. The pre-heated E-Glass fibers and fly ash particles were then added into the crucible and by using a mechanical stirrer it was thoroughly mixed and then poured into a preheated die. The melt is then allowed to solidify in the die. The different castings were obtained in the same way by varying the compositions as given in the table-1. The cast specimens were machined according to the ISO 1608 standards and then they were subjected to thermal treatment (solution heat treatment with water quench). Test samples were solutionised in a heat treatment furnace for a temperature of 520^0 C. After solutionsing the samples were immediately quenched in water at room temperature and aged for 1, 3 and 5 hours respectively.

Figure 1: Electric arc furnace

Table 1: Casting compositions (weight in %)

Casting Sample	C1	C2	C3	C4	C5	C6	C7	C8	C9	Plain
%Fly ash	1	1	1	2	2	2	3	3	3	-
% E-Glass	1	2	3	1	2	3	1	2	3	-
% Al 7075	98	97	96	97	96	95	96	95	94	100

Metallographic Studies

Microstructure observations have been done with the aid of a metallurgical microscope to obtain some qualitative evidences on the combined fly ash, E-Glass particulate distribution in the alloy matrix, bonding quality between two particulates and the matrix. The samples were viewed at different magnifications and photomicrographs shown in the Fig 2. were captured to predict the confirmation of the presence of the two particulates in the alloy matrix. It is found that the distribution of reinforcements in the matrix is uniform. The alloy matrix grains are finer and the bonding between particulate surface and the matrix material is satisfactory. No interfacial reaction products are observed superficially.

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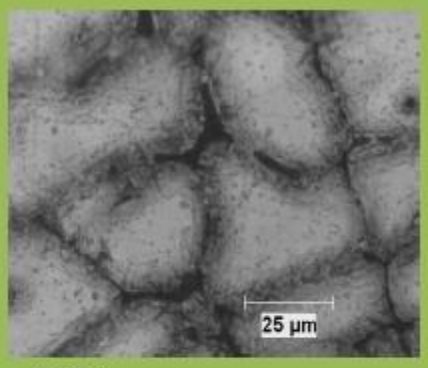

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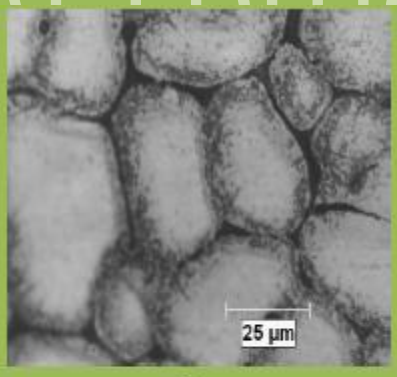

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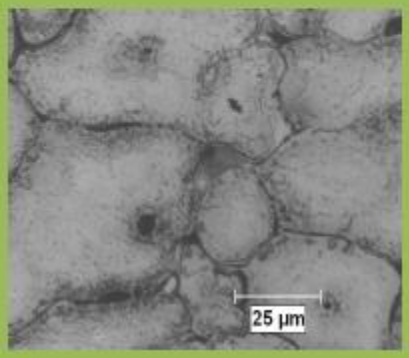

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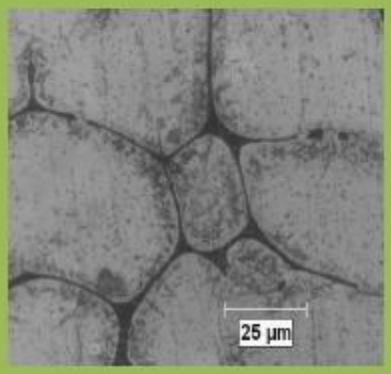

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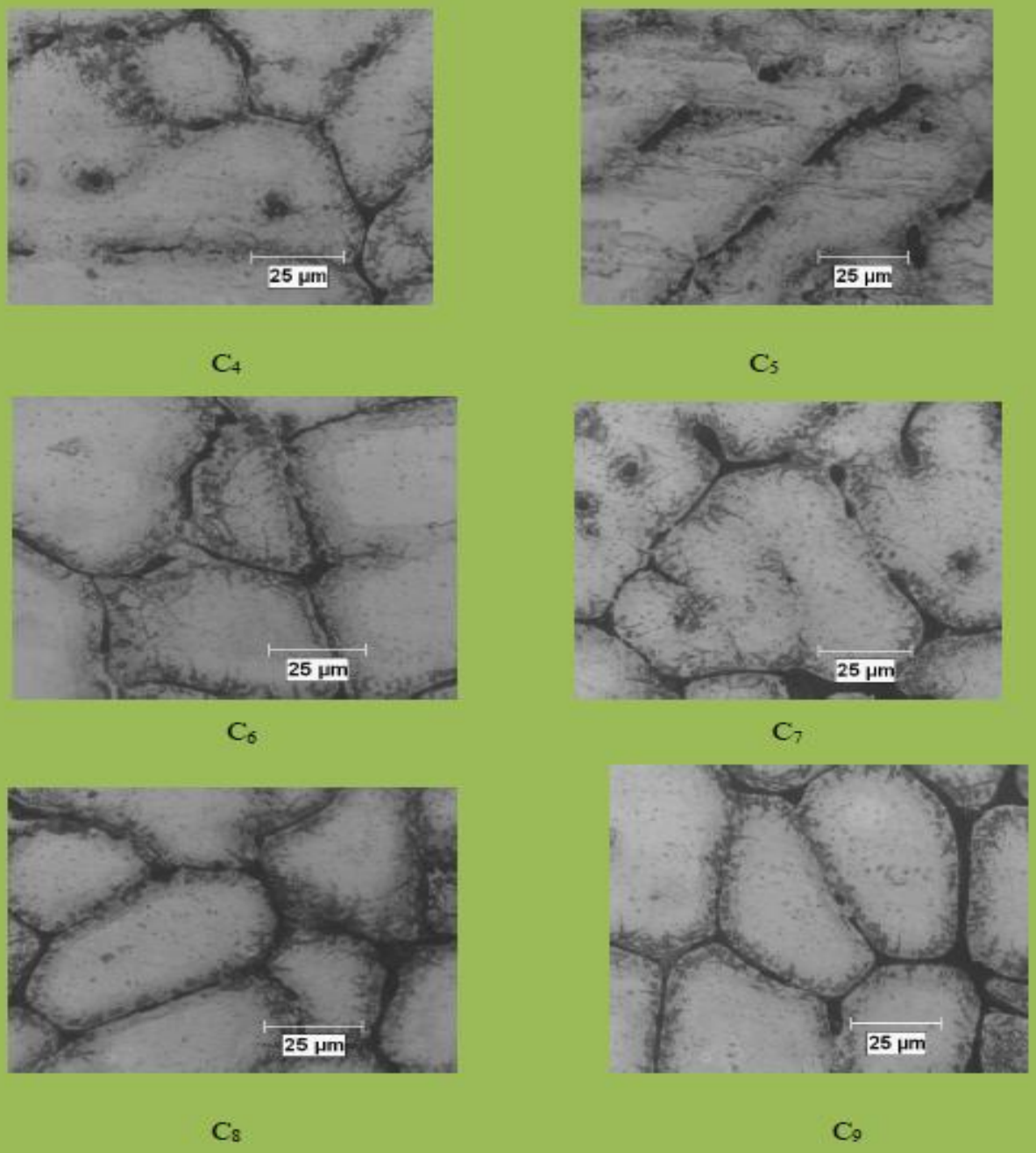

Figure 2: Microstructure of different compositions

Hardness test

Hardness tests were performed on as cast and composites to know the effect of fly ash and E-glass in the matrix material. The polished specimens were tested using Brinell's hardness testing machine. A load of 60 kg for a period of 10 seconds was applied on specimens. The indenter has diameter of 2.5". The indentation diameter on testing specimen was measured using optical microscope. The test was carried out at three different locations and the average value was taken as the hardness of the as cast and Hybrid composite specimens at various conditions. The values are tabulated in Table 2.

Hardness calculation

Brinnell's hardness number of a formed specimen is calculated by using the formula,

$$\mathbf{BHN} = \frac{\boldsymbol{P}}{\left(\frac{\boldsymbol{\pi D}}{\mathbf{2}}\right) \times \left(\boldsymbol{D} - \sqrt{\boldsymbol{D^2} - \boldsymbol{d^2}}\right)}$$

P= Load (60 kg), D= indenter diameter (2.5mm), d= surface indentation diameter

Table 2: Hardness (BHN) of specimens at different conditions.

Sample	Plain	C1	C2	C3	C4	C5	C6	C7	C8	C9
As Cast	75	77	86	98	107	117	120	135	138	140
1-hr. aging	80	82	87	101	109	118	124	137	141	146
3-hr. aging	90	85	92	106	112	122	127	140	144	150
5-hr. aging	100	90	94	107	122	124	126	141	145	152

Specific Wear Rate of composites

The prepared wear specimens were subjected to wear testing. The wear loss of a specimen was displayed on the display window. By varying the different parameters, volumetric wear rate was calculated and tabulated in the table 3.

Table 3: Wear rate at different conditions

Sample	Plain	C1	C2	C3	C4	C5	C6	C7	C8	C9
As Cast ($\times 10^{-4} mm^3/N\text{-}m$)	1.65	1.60	1.51	1.38	1.31	1.12	1.01	0.96	0.89	0.83
1-hr. aging ($\times 10^{-4} mm^3/N\text{-}m$)	1.59	1.51	1.41	1.39	1.27	1.18	0.98	0.85	0.79	0.71
3-hr. aging ($\times 10^{-4} mm^3/N\text{-}m$)	1.48	1.41	1.29	1.21	0.97	0.86	0.74	0.63	0.58	0.54
5-hr. aging ($\times 10^{-4} mm^3/N\text{-}m$)	1.35	1.27	1.12	1.09	0.85	0.78	0.63	0.56	0.49	0.40

Results and Discussions

Hardness tests were performed on as cast and composites to know the effect of the reinforcements. The polished specimens were tested as per ASTM 10 standards and the values are tabulated, plotted as shown in Figures 3,4 & 5. From the figures it is evident that the hardnes of the composite material is much higher than the parent material. Also, the hardness of the composite material increases with wt. % of reinforcements and heat treatment.

Hardness of different specimen at different conditions

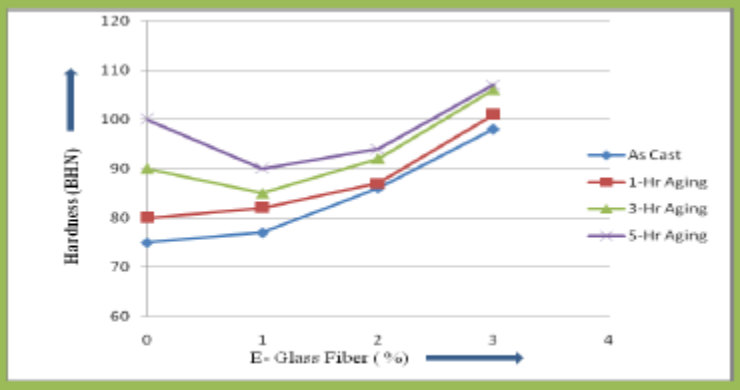

Figure 3: Hardness with 1% constant fly ash

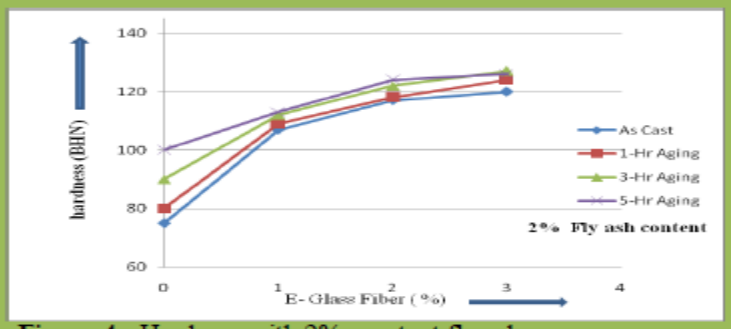

Figure 4: Hardness with 2% constant fly ash

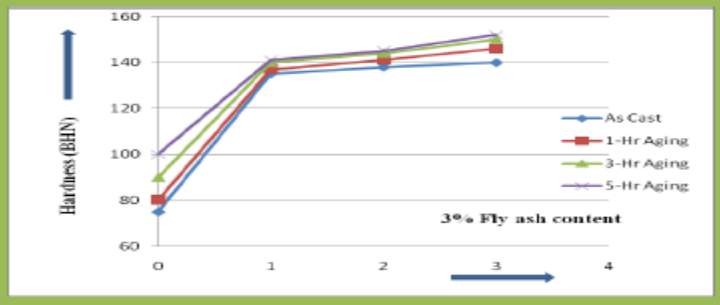

Figure 5: Hardness with 3% constant fly ash

Wear behavior of different composite materials were studied with parameters as sliding velocity and keeping applied load constant. We can see from the graphs that increase of reinforcement percentage, the wear rate has been decreased gradually.

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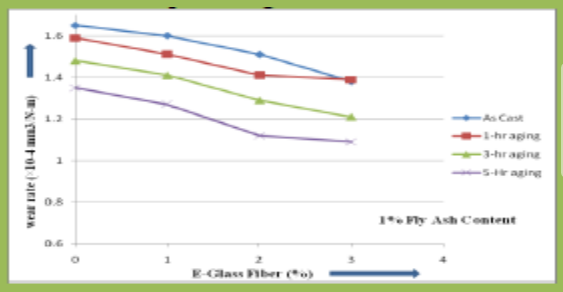

Figure 6: Wear rate with 1% constant fly ash

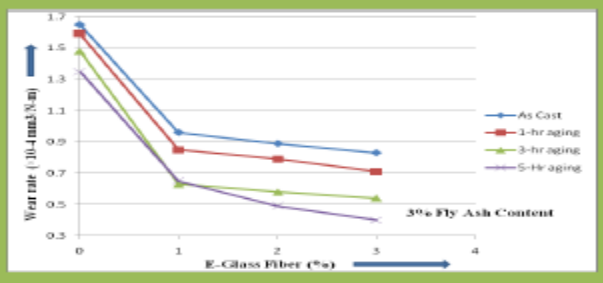

Figure 7: Wear rate with 2% constant fly ash

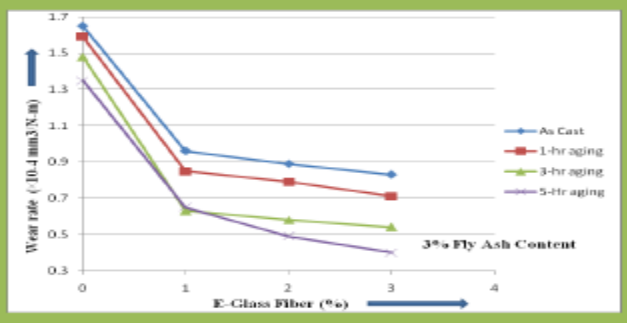

Figure 8: Wear rate with 3% constant fly ash

Conclusion

Based on the experimental investigation carried out on the fly ash, E-glass reinforcements with Al 7075 as matrix material, the following conclusions are made:

- Using stir casting method, fly ash particulates and E-glass fiber can be successfully introduced in the Al 7075 matrix alloy material to fabricate hybrid composite material.
- From the microstructure analysis, it is evident that the composites fabricated have fairly even distribution of reinforcements in them.
- The hardness and wear resistance of the composite material were increased with increase in weight % of fly ash, E-glass fibers.
- Hardness and wear resistance of heat treated composites were higher when compared to as cast composite.
- The MMC formed is superior to Al 7075 alloy, with almost same density as that of the individual.

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ARTICLE 6

MODELING CLOUD COMPUTING EFFECT ON ENTERPRISES "IN TERMS OF EFFECTIVE AND DATA SECURITY MODELING"

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Abstract:

Innovations are necessary to ride the inevitable tide of change. Most of enterprises are striving to reduce their computing cost through the means of virtualization. This demand of reducing the computing cost has led to the innovation of Cloud Computing. Cloud Computing offers better computing through improved utilization and reduced Administration and infrastructure costs. Cloud Computing is the sum of Software as a Service (SaaS) and Utility Computing. Cloud Computing is still at its infant stage and a very new technology for the enterprises. Therefore, most of the enterprises are not very confident to adopt it. This research paper tackles this issue for enterprises in terms of cost and security. In this paper I discussed the Benefits and drawbacks an enterprise can have while they adopt Cloud Computing in terms of effective and data modeling security parameters measurements. In the end, concluding that Cloud Computing is better for medium and small sized enterprises as compared to large enterprises in terms of both data modeling and data security.

Introduction & Background

Cloud Computing has become one of the most talked about technologies in recent times and has lots of attention from media as well as analysts because of the opportunities it is offering. Recent IDC cloud research shows that worldwide revenue from public IT cloud services exceeded $21.5 billion in 2010 and will reach $72.9 billion in 2015, representing a compound annual growth rate (CAGR) of 27.6%. This rapid growth rate is over four times the projected growth for the worldwide IT market as a whole (6.7%). By 2015, one of every seven dollars spent on packaged software, server, and storage offerings will be through the public cloud model. The cloud movement is about much more than the cloud. Cloud cannot be sufficiently understand as a standalone phenomenon in the IT market, but rather as a core ingredient of a larger transformation of the IT industry - and many other industries using IT to transform them. Other ingredients enabled by cloud - and, in turn, accelerating cloud adoption - include the expanding "species" of mobile devices, the explosion of mobile apps, the growing availability of wireless broadband, and the explosion of big data tools. Enterprises have been striving to reduce computing costs and for that, reason's most of them start consolidating their IT operations and later using virtualization technologies. For the good of the enterprises, there is a new technology to help them in this i.e. Cloud Computing. Cloud Computing claims to take enterprises search to a new level and allows them to further reduce costs through improved utilization, reduce administration and infrastructure cost and faster deployment cycles.

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Cloud computing architecture

NIST (National Institute of Standards and Technology) is a well-accepted institution all over the world for their work in the field of Information Technology. I present the working definition provided by NIST of Cloud Computing. NIST defines the Cloud Computing architecture by describing five essential characteristics, three cloud services models and four cloud deployment models.

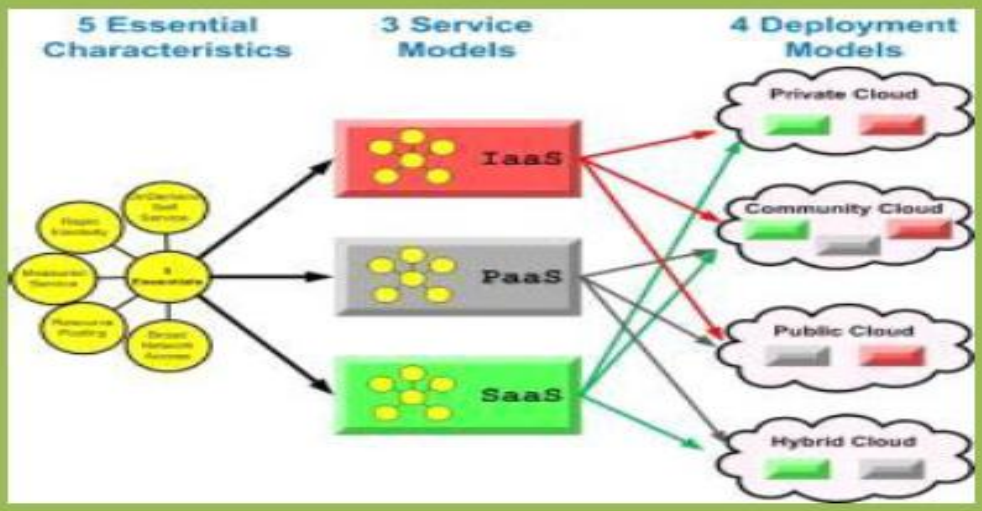

Figure (1) NIST: Interrelationships with Characteristics, Service Models and Deployment Models

To present cloud computing all five must be present or what you have is something close but not quite cloud:

- **On-demand self service**: This means the consumer, including non-IT folks, can unilaterally provision the service and scale it up or down them.
- **Broad network access**: This means the service is available using the standard array of devices including traditional PC's, portable computers and mobile devices.
- **Resource pooling**: This means consumers share a common multi-tenant environment where physical and virtual resources may be dynamically allocated.
- **Rapid elasticity**: This means the service can be quickly scaled, often automatically, such that the capacity appears limitless to the consumer.
- **Measured service**: This means the service and its required resources are metered for both the consumer and the provider.

Three delivery models in cloud computing

- **IaaS:** Basic computing resources such as processing power, data storage and networking components are provided to the consumers. The consumer have access to control the operating system, storage, deployed applications and possibly networking components such as firewalls and load balancers. However, the cloud infrastructure beneath them, that is used to provision virtual machine instances or storage instances are not exposed to the consumer and would be managed by the service provider.
- **PaaS:** Application hosting environments are provided to the consumer. The environment provided can be used by the consumer as the platform on top of which consumer controlled applications are run. The platform is typically an application framework. The platform environment and the infrastructure on top of which it is run (operating system, hardware and network infrastructure) will be managed by the service provider on behalf of the consumer.
- **PaaS:** Application software is provided to the consumer. The service provider on behalf of the consumer manages all three layers - application, platform and infrastructure. The consumer can just focus on the use of the application.

The NWEST definite on of cloud computing offers four cloud deployment models:

- **Private Cloud**: The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may exist on premise or off premise.
- **Community Cloud:** The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns. It may be managed by the organizations or a third party and may exist on premise or off premise.
- **Public Cloud**: The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.
- **Hybrid Cloud:** The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability.

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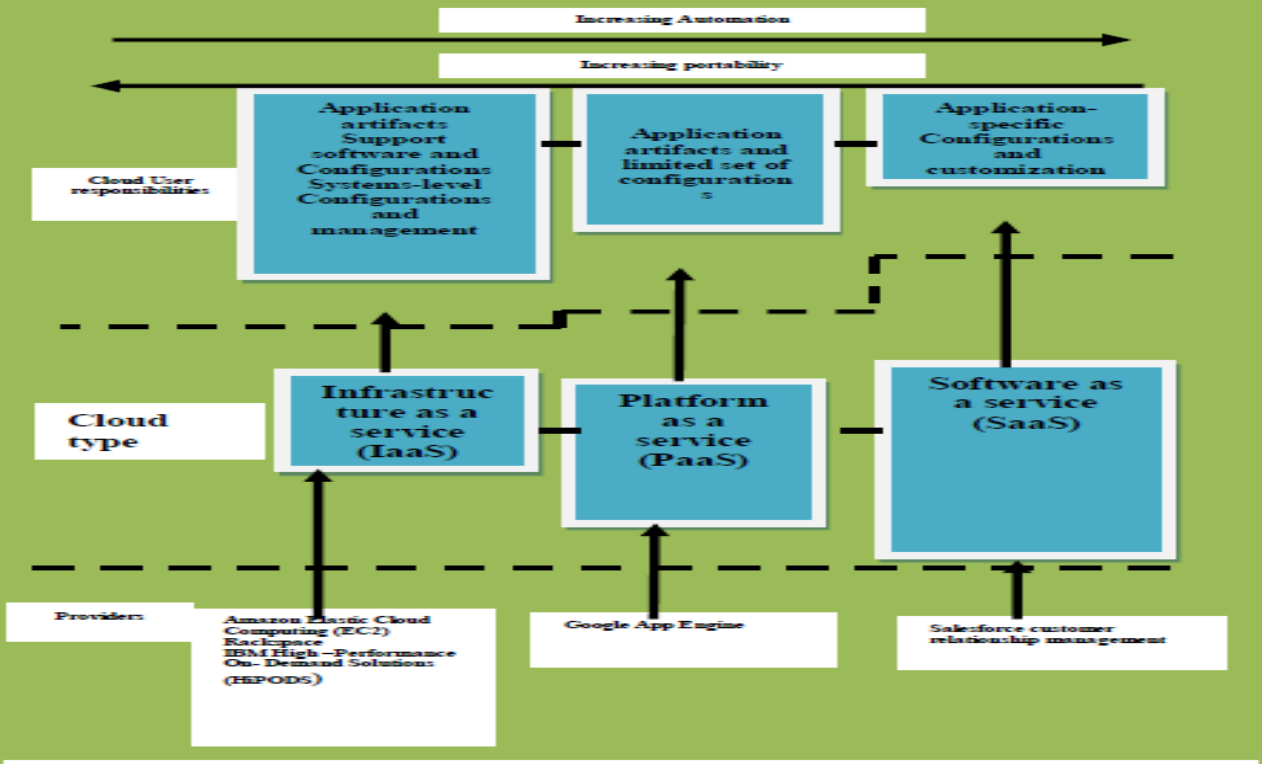

Figure (2) the cloud landscape illustrate the difference in user responsibility for each of the three types of cloud data model for cloud computing

Data modeling in cloud computing security issues:

- Every breached security system was once thought infallible
- Understand the risks of cloud computing
- How cloud hosting companies have approached security
- Local law and jurisdiction where data is held

Best practice for enterprises in the cloud:

- Inquire about exception monitoring systems
- Be vigilant around updates and making sure that staff doesn't suddenly gain access privileges they're not supposed to.
- Ask where the data is kept and inquire as to the details of data protection laws in the relevant jurisdictions.
- Seek an independent security audit of the host
- Find out which third parties the company deals with and whether they are able to access your data
- Be careful to develop good policies around passwords; how they are created, protected and changed.
- Look into availability guarantees and penalties.
- Find out whether the cloud provider will accommodate your own security policies

Semantic data modeling for cloud computing

A method of organizing data that reflects the basic meaning of data items and the relationships among them. This organization makes it easier to develop application programs and to maintain the consistency of data when it is updated.

Cloud computing has lately become the attention grabber in both academia and industry. The promise of seemingly unlimited, readily available utility-type computing has opened many doors previously considered difficult, if not impossible, to open. The cloud-computing landscape, however, is still evolving, and we must overcome many challenges to foster widespread adoption of clouds. The main challenge is interoperability. Numerous vendors have introduced paradigms and services, making the cloud landscape diverse and heterogeneous. Just as in the computer hardware industry's early days, when each vendor made and marketed its own version of (incompatible) computer equipment, clouds are diverse and vendor-locked. Although many efforts are under way to standardize clouds' important technical aspects, notably from the US National Institute of Standards and Technology (NIST), consolidation and standardization are still far from reality. In this two-part article, we discuss how a little bit of semantics can help address clouds' key interoperability and portability issues.

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Using Cloud Computing for Enterprise Improvements

As technology develops there is a need for companies and enterprises to figure out how to use cloud computing for enterprise improvements. This means boosting output while keeping costs down. For the smart enterprise, cloud computing provides a unique critical success factor that if harnessed properly could allow a enterprise to operate more cost effectively than the competition. Like most technologies, cloud computing streamlines operations, reduces their cost and reduces strain on resources like power while at the same time providing higher security.

These are ways that an enterprise can employ cloud computing to improve its operations and productivity:

- **Data duplication:** Unlike physical servers that can cost a lot to maintain let alone buying backups, cloud computing allows companies to have multiple copies of information on various virtual servers meaning work flow won't be affected by technical glitches
- **Access control:** With the right amount of skill, an intruder can access a physical server and damage or steal data. This kind of access is impossible under cloud as security is much tighter
- **Innovation:** enterprises as if banks and training institutions get a plat form apoun that they can build new products and services that are easily accessible to the consumer.
- **Outsourcing:** Clouds make it easier for a enterprise to outsource noncore enterprise activities like customer care to offsite and even overseas locations which is more cost effective.
- **Tele-working:** It enables workers to carry out their jobs at convenient locations reducing fixed costs brought about by hiring premises and transport cost.
- **Efficient data handling:** Unlike in conventional situations where data access maybe slow or hampered by excessive traffic to one server, the cloud doesn't suffer from this.
- **Increase technical capability:** Cloud computing allows deployment of specialized software and tools that would have otherwise cost too much to use in the traditional setting.
- *Cloud computing can become popular way for enterprises to increase their presence online, gaining benefits in an enterprise that stands how to use cloud computing for enterprise improvements include:*
- **Reduced cost**: The combined cost of physical infrastructure and maintenance is avoided.
- **Convenience**: Relocating to new facilities is easier as not much time is needed to set up.
- **Security and safety**: All data and software a firm uses is safe and secure in offsite locations.
- These are just a few of the reasons why enterprises should learn how to use cloud computing for enterprise improvements. Small and big enterprises are using this new technology to enhance their operations.

QoS in Data Cloud Computing

Everything in data cloud computing is delivered as service, So quality of service is inevitable, QoS has multiple aspects such as: Response time, Throughput, Availability, Reliability, Security, QoS requirements for a Cloud

- The QoS must system be able to manage several simultaneous services with a specific response time limitation for each service
- The QoS system must supply service differentiation in the service provider to the consumer – consumer category
- The QoS system must support the grouping of interactions in sessions.
- The QoS system should not require modification in the system software of the servers
- The QoS system should be easy to configure
- The QoS system must be scalable to operate in both a single server and a cluster of servers
- The QoS system must provide protection against overloads and low utilization
- The QoS system may support dynamic negotiation of parameters

Conclusion

Modeling data security in Cloud Computing and SaaS is definitely going to make a huge impact to our current way of working. Consuming and exposing all software services over the HTTP network would enable the organization IT infrastructure to fully depending on the Internet medium. There have been criticisms and counter-criticisms for such a dependency. If SaaS becomes fully functional, it might probably solve one of the major concerns of the software enterprises, which is making the application development companies lose billions of dollars each year, and that is illegal piracy of software.

In this paper work, I study modeling data security in Cloud Computing in the enterprises. The specific areas we worked during my study were data modeling cost and security. I have found that Cloud Computing is a very hot topic now days and many enterprises are interested in it. Most of the enterprises have idea about it but still there is confusion about the real definition of Cloud Computing. This is understandable as this technology is in its infant stage however, as it evolved from Grid Computing therefore, most of the enterprises which have used Grid Computing are better able to understand the term Cloud-Computing. There is a confusion or disagreement about the boundaries of Cloud-Computing as many enterprises and even cloud providers believe that private cloud is apart of Cloud Computing. However, in this work we found that Cloud Computing is the sum of Software as a Service (SaaS) and Utility Computing, but does not include Private Clouds. The enterprises that are in the process of making a decision to adopt Cloud Computing face real dilemma as they hear different (positive and negative) views from different sources. The first characteristic that tends enterprises to think about Cloud Computing is the cost effect. We have done a thorough research about the cost effect on enterprises. There are many factors or characteristics, which affect the cost of Cloud Computing for enterprises. These factors include ***elasticity, flexibility, data center cost, pricing models and administrative*** costs. The elasticity is the biggest factor to make Cloud Computing cost effective for enterprises and most of the enterprises move to cloud because of this characteristic of Cloud Computing. We have concluded that enterprises save their capitally not building their data center and not hiring employees for managing them. Along with that flexibility and different pricing models makes Cloud Computing more cost-effective for enterprises. However, an important finding is that these benefits are only for medium sized or small enterprises. The large enterprises can save their cost by building big data center due their demand and capital they have. In other words, private cloud is something perfect for the large enterprises.

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We have concluded that Cloud Computing have many security issues for enterprises. These issues include no control over physical data, web browser security, and distributed denial of service attacks, loss of encryption keys, legal risks, network problems and natural disasters. However, along with these drawbacks there are some also some benefits for enterprises. These benefits are of scale, standard interface, logging, risk management, and effective updates and defaults. However, in my empirical study, we have concluded that these benefits do not overcome the security issues of Cloud Computing. Hence, enterprises should not adopt Cloud computing because of better security for their data. Briefly, I conclude that Cloud Computing is emerging as a big and beneficial technology of present day and future. Much of work is being put in it and one can expect more progress in Cloud Computing technology. However, for enterprises, the most important factor to adopt Cloud Computing will stay cost till today and security is still not the benefit of Cloud Computing for enterprises despite its benefits. The most important finding is that the Cloud Computing is ideal for medium and small sized enterprises both in terms of cost benefits. However, in terms of security, it is not so beneficial for medium and small enterprises to adopt Cloud Computing. For large enterprises, it is more effective to adopt private cloud because with private cloud they can save cost and have better security.

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ARTICLE

7

INTERPRETATION OF HYDROGEOLOGICAL PARAMETERS FROM VERTICAL ELECTRICAL SOUNDING
(A CASE STUDY OF SHAMUKA BEACH IN ODISHA)

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Abstract:

Puri is a well-known and most demandable sea beach in India. It otherwise keeps its demand too high due to the Lord Jagannath temple being located at the coast of Bay of Bengal. The state government as well as central government have taken up different project works to further develop the region in accommodating massive tourists who visit every year. Though the area is congregated by hundreds of hotels, dharmsalas and resorts but still with all modern amenities and luxury for higher class of tourists is still unavailable. This creates a major disadvantage to lodge the tourists who want to spend an extended period. Keeping all those conditions into consideration a new locality named Shamuka beach is going to be developed by Orissa Tourism Development Corporation (OTDC). To progress with any new locality the major problem lies with communication and water supply. Different agencies have studied in detail regarding the subsurface lithology, water resource development and management as well as quality analysis of either the surface, subsurface and groundwater of the region. Majority of the organisations have suggested for groundwater exploitation to avoid saline taste for drinking purpose from surface or water from any static body. To enhance further study, the work has been undertaken in order to meet the basic requirements like drinking, palatable and domestic water. Several vertical electrical sounding data (VES) have been collected from different sources to analyse the water demand of the region. It was found that the aquifers are restricted from unconsolidated to semi-consolidated region. Water occurs at a depth of mere 10m below ground level, which are brackish in nature but deep aquifers extending up to a depth of 200m are usually saline in nature. The saline water intrusion to deep freshwater is limited.

Introduction

Coastal aquifers are a nexus of the world's oceanic and hydrologic ecosystems and provide a water source for more than one billion people living in coastal regions. Saltwater intrusion caused by excessive groundwater extraction is already impacting diverse regions of the globe. Coastal aquifers are more vulnerable to groundwater extraction than to predicted sea-level rise under a wide range of hydrogeologic conditions and population densities. Only aquifers with very low hydraulic gradients are more vulnerable to sea-level rise and these regions will be impacted by saltwater inundation before saltwater intrusion (Ferguson and Gleeson, 2012). An estimated increase in 15% recharge, the sea level may increase by 0.4m in the next 100 years (Vandenbohede et.al, 2008). All groundwater can be said to originate as atmospheric or surface water and principal sources of natural recharge of groundwater are falling precipitation that eventually percolates, and seepage from the stream flow in channels, lakes and reservoirs (Ufoegbune et.al, 2009). Because of its several inherent qualities, groundwater can play an important role in ensuring sustainable water supply in the region. This study was carried out to assess groundwater condition in and around Shamuka region using surface resistivity method.

IMAGE EDITION

Vertical electrical sounding (VES) surveys were carried out at 16 sites using the Schlumberger array. The apparent resistivity-depth datasets (henceforth called "VES data") thus obtained was interpreted for the existence of groundwater (Jha et.al. 2008).The Orissa Tourism Development Corporation is planning to develop a tourism hob known as "Shamuka Beach Special Tourism Project" on the sea shore located at Sipasarubali, which is about 7km away west of Puri town. The proposed project is being setup on 972 acres of land (about 1.7km length and 1.3km breadth). As indicated by OTDC total requirement of water for project is around 14MLD for different purposes. This study is carried out to delineate the fresh water aquifers and to evaluate the availability of Ground Water Resources in the project area to meet their water requirement.

Study area

The study area is located at Sipasarubali village about 7km west of Puri town on the left side of the road leading to Brahmagiri approaching from Giral village. The area features in the Survey of India topo-sheet No. 74E/9 & 13 extending from latitude N $19^0 46' 30''$ to $19^0 47' 40''$ and longitude E $85^0 45' 15''$ to $85^0 46' 30''$. The area is restricted by Bay of Bengal in south, Mangla river in the north, Samanga cut in the east and Balabhadra Patna on the west.

This work is undertaken with the following objectives.

- To delineate the occurrence of fresh water aquifer in the study area through geophysical investigations;
- To delineate the fresh/ saline zone interface by interpretation of VES results;
- To assess the water quality by analysing the water samples collected from existing tube wells in and around the project area;
- Hydro-geomorphological study through interpretation of local geology.

MATERIALS AND METHOD

The study area comes within the coastal tract, which has a very complex hydro-geological set up. Availability of fresh water is not so abundant. Moreover, the area suffers from salinity hazards. Hence before planning for extraction of ground water it would be appropriate to delineate the fresh water bearing aquifers and the saline/fresh

interface. The quality of ground water should also be assessed through chemical analysis. Electrical prospecting makes use of a variety of principles, each based on some electrical properties or characteristics of the materials within the earth (Olorunfemi et.al 1995 and Singh et.al 2002). In this study, Vertical Electrical Sounding (VES) method has been applied. VES survey was carried out in 16 locations using schlumberger electrode configuration. The Schlumberger method was adopted for this study because the fieldwork is faster, easier, economic and software's are readily available for its interpretation (Todd 1980, Fetter 1994, Patra and Nath 1999, Selvam et. al, 2010). The resistivity values of the layers were measured using the ABEM SAS 300B Terrameter. The Schlumberger soundings were carried out with current electrode spacing (AB) ranging from 2m to 300m (AB/2=1m to 150m).The distance used for potential electrode spacing (MN) ranged from 0.3m to 10m (MN/2=0.15m to 5m). At each VES station electrodes were placed in a straight line and the inter-electrode spreads were gradually increased about a fixed centre. The current was sent into the ground and the potential difference (V) due to this current was measured and recorded against the electrode spacing. With these values of currents (I) and potential (V) of the electrode configuration adopted one can get the apparent resistivities (a). The apparent resistivity values were plotted against AB/2 on double–log graph sheets. The manner in which apparent resistivity values increase or decrease with electrode separation forms the basis for choosing the shape of the field curve that can perform quantitative interpretation of the sub surface resistivity distribution (Gyansundar and Elango, 1999, Singh et. al, 2002 and Muthuraj et.al, 2010). The VES data are interpolated taking the geology of the region to interpret the lithology and its behaviour to hold and yield considerable quantity of groundwater.

It is reported by OTDC that the total water requirement for the project is about 14 MLD for different purposes to be meet from ground water resources. As the project area is close to the Bay of Bengal, availability of fresh ground water is too limited. Besides, the present demand is met from ground water through production wells.

A. Physiography

The climate of the city is humid-subtropical and has about 1000mm average annual rainfall with an average of 71 rainy days per year. Geologically the area is underlained by Recent to Sub-recent sediment deposits forming the narrow coastal tract. The lithological assemblage is characterized by the cyclic sedimentation of sand and gravel with subordinate clay. The recent to sub-recent formations consist of sediments of varied thickness and occur along the coastal belt. These deposits consist of clay, sand, gravel and pebbles. The dune sands occur along the sea coast which has been formed due to wind action. The area forms a part of the narrow elongated coastal alluvial tract consisting of various coastal geomorphic features such as deltaic plain, older alluvial plain, younger alluvial plain, beach ridges, coastal sand dunes and mud flats etc. formed due to sedimentation under different climatic conditions and marine transgression at different geological times. The coastal sand dunes occur almost parallel to the present day shore line and the width of this division varies from few 100m to 7km. The geomorphic features are of fluvio-marine and aeolian origin. The geological setup of the study area controls occurrence and movement of ground water. The unconsolidated sand and gravel layers of Tertiary and Quaternary age forms repository of ground water. Hydro-geologically the area is underlained by unconsolidated formations of alluvium. The shallow (near surface) aquifers are under water table condition and are essentially restricted to a depth of 50m below ground level. The aquifers further below up to 100m to 150m below are under semi-confined conditions, while the deeper aquifers are under confined conditions. The sands and gravels encountered in Upper Tertiary formation are porous and permeable. The thickness of the sediments increases towards coast exceeding 600m. These are the repository of ground water in the area. Most of the coastal alluvial tract suffers from salinity hazard. In these areas the distribution of fresh water and saline aquifers is non-uniform with varied disposition such as:(a)saline water overlying fresh water;(b)fresh water overlying saline water;(c)alternate fresh and saline water zones and(d)saline water at all depth up to base rock.

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B. Geophysical Investigations

Geophysical investigation is an indirect method of exploration to detect the subsurface layers in terms of type of aquifers, depth of occurrence and extension of aquifers. The georesistivity sounding test measures variations in the electrical resistivity of sub-surface formation layers by applying electrical currents across arrays of electrodes inserted in the ground to determine the physical characteristics of formations in terms of water availability.

C. VES Tests

Vertical Electrical Sounding (VES) tests have been conducted at 16 locations in grid of 0.5km spacing covering whole area with a view to identify the fresh/saline nature as well as each site VES test has been carried out adopting the Schlumberger configuration with a maximum spreading (AB/2) of 500m, so as to delineate the aquifer zones. The apparent resistivity data was computed from the field observations of potential difference and the current value. The data have been iterated in computer using JESIX software to work out the true resistivity value and thickness of each subsurface layer.

D. VES Test Results

The results of VES tests conducted at 16 (sixteen) sites reveal that different formation layers are there up to approximately 350m depth below ground level. The probable litho-layers have been interpreted basing on the local

geology, hydro-geology and geomorphology of the area. The fresh/brackish/saline water bearing layers are identified basing on the true resistivity value of the layer. The sounding test result for each site is given in the Table 1 below.

Based on the VES results and hydrogeological considerations, 25 wells were initially drilled and later on 8 more wells were drilled intercepting through the bedrock. In addition, lithologs from 6 additional wells are available in the same watershed. Thus with the help of lithologs from 39 wells, thicknesses of various layers and bedrock depths were determined. These sets of data from the lithologs were analysed geostatistically and an estimation of these parameters was made at all the 86 locations using a final variogram obtained from the variographic analysis. This has provided a range for the estimated values of the above three parameters using the standard deviation of the estimation error. The interpreted parameters from VES were compared with the range thus obtained in the above procedure. The interpreted VES results that could not be found within the stipulated range provided by the geostatistical estimation were categorized separately and a suitable reinterpretation was made for them by fitting some parameters obtained from the nearby well data. After a few iterations, a large number of VES results were found falling in the estimated range and thus reduced the ambiguities in the VES results. The study has provided a new and additional method of reducing the ambiguities in VES interpretation as well as providing a quality indicator to each interpretation (Kumar et.al, 2007).

Table 1. VES Test Results

Site	Latitude (N)	Longitude (E)	Layer	Resistivity in Ωm	Thickness in m	Depth in m	Probable lithology	Remarks
VES-1	$19^0 47' 37''$	$85^0 46' 28''$	1st	8300.0	1.0	1.0	Sandysoil (dry)	Fresh
			2nd	593.0	2.8	3.8	Sand	Fresh
			3rd	167.0	47.0	50.8	Sand	Fresh
			4th	17.5	73.2	124.0	Sandyclay	Brackish
			5th	159.0	142.0	266.0	Sand	Fresh
			6th	2.8	Infinite	Infinite	Clay	Saline
VES-2	$19^0 47' 37''$	$85^0 46' 11''$	1st	16225.4	0.7	0.7	Sandysoil (dry)	Fresh
			2nd	526.6	6.3	7.1	Sand	Fresh
			3rd	126.5	51.5	58.6	Sand	Fresh
			4th	24.0	67.7	126.3	Sandyclay	Brackish
			5th	64.3	Infinite	Infinite	Sand	Fresh

VES-3	19°47'20"	85°46'28"	1st	1110.0	0.4	0.4	Sandysoil (dry)	Fresh
			2nd	3600.0	1.0	1.5	Sand	Fresh
			3rd	100.0	83.9	85.4	Sand	Fresh
			4th	22.5	59.6	145.0	Sandyclay	Brackish
			5th	161.0	139.0	284.0	Sand	Fresh
			6th	2.1	Infinite	Infinite	Clay	Saline
VES-4	19°47'20"	85°46'11"	1st	23500.0	1.1	1.1	Sandysoil (dry)	Fresh
			2nd	1780.0	11.4	12.5	Sand	Fresh
			3rd	88.0	62.0	74.5	Sand	Fresh
			4th	42.6	71.5	146.0	Sandyclay	Brackish
			5th	124.0	100.0	246.0	Sand	Fresh
			6th	2.0	Infinite	Infinite	Clay	Saline
VES-5	19°47'20"	85°45'53"	1st	9800.0	0.8	0.8	Sandysoil (dry)	Fresh
			2nd	480.0	4.1	4.8	Sand	Fresh
			3rd	171.0	58.5	63.3	Sand	Fresh
			4th	31.6	79.7	143.0	Sandyclay	Brackish
			5th	223.0	114.0	257.0	Sand	Fresh
			6th	5.2	Infinite	Infinite	Clay	Saline
VES-6	19°47'20"	85°45'36"	1st	41200.0	1.1	0.4	Sandysoil (dry)	Fresh
			2nd	1050.0	11.4	3.3	Sand	Fresh
			3rd	162.0	62.0	66.1	Sand	Fresh
			4th	27.4	71.5	127.0	Sandyclay	Brackish
			5th	213.0	100.0	231.0	Sand	Fresh
			6th	4.9	Infinite	Infinite	Clay	Saline
VES-7	19°47'04"	85°46'28"	1st	17200.0	1.1	4.2	Sandysoil (dry)	Fresh
			2nd	1420.0	11.4	17.0	Sand	Fresh
			3rd	108.0	62.0	62.9	Sand	Fresh
			4th	50.3	71.5	140.0	Sandyclay	Brackish
			5th	145.0	100.0	252.0	Sand	Fresh
			6th	4.8	Infinite	Infinite	Clay	Saline
VES-8	19°47'04"	85°46'11"	1st	960.0	4.2	0.7	Sandysoil (dry)	Fresh
			2nd	3050.0	12.8	3.3	Sand	Fresh
			3rd	85.0	45.9	34.3	Sand	Fresh
			4th	34.4	77.1	112.0	Sandyclay	Brackish
			5th	126.0	112.0	219.0	Sand	Fresh

			6th	3.0	Infinite	Infinite	Clay	Saline
VES-9	19°47'04"	85°45'53"	1st	6490.1	0.9	0.9	Sandysoil (dry)	Fresh
			2nd	454.3	3.9	4.8	Sand	Fresh
			3rd	121.1	56.9	61.7	Sand	Fresh
			4th	12.3	100.3	162.0	Sandyclay	Brackish
			5th	65.6	61.0	223.0	Sand	Fresh
			6th	4.9	Infinite	Infinite	Clay	Saline
VES-10	19°47'04"	85°45'36"	1st	3830.0	1.2	1.2	Sandysoil (dry)	Fresh
			2nd	143.1	5.4	6.6	Sand	Fresh
			3rd	76.3	33.6	40.2	Sand	Fresh
			4th	15.8	105.8	146.0	Sandyclay	Brackish
			5th	55.4	51.0	197.0	Sand	Fresh
			6th	5.1	Infinite	Infinite	Clay	Saline
VES-11	19°46'49"	85°46'11"	1st	4800.0	1.2	1.2	Sandysoil (dry)	Fresh
			2nd	1150.0	9.3	10.5	Sand	Fresh
			3rd	77.9	33.1	43.6	Sand	Fresh
			4th	29.8	122.4	166.0	Sandyclay	Brackish
			5th	176.0	98.0	264.0	Sand	Fresh
			6th	4.0	Infinite	Infinite	Clay	Saline
VES-12	19°46'49"	85°45'53"	1st	12400.0	1.0	1.0	Sandysoil (dry)	Fresh
			2nd	374.0	18.8	19.8	Sand	Fresh
			3rd	80.0	54.4	74.2	Sand	Fresh
			4th	40.5	69.8	144.0	Sandyclay	Brackish
			5th	130.0	97.0	241.0	Sand	Fresh
			6th	3.9	Infinite	Infinite	Clay	Saline
VES-13	19°46'49"	85°45'36"	1st	27600.0	1.0	1.0	Sandysoil (dry)	Fresh
			2nd	1160.0	5.6	6.6	Sand	Fresh
			3rd	274.0	19.4	26.0	Sand	Fresh
			4th	29.8	46.5	72.5	Sandyclay	Brackish
			5th	173.0	106.5	179.0	Sand	Fresh
			6th	3.9	Infinite	Infinite	Clay	Saline
VES-14	19°46'49"	85°45'21"	1st	4930.0	0.9	0.9	Sandysoil (dry)	Fresh
			2nd	1000.0	1.1	2.0	Sand	Fresh
			3rd	386.0	24.2	26.2	Sand	Fresh
			4th	33.8	59.3	85.5	Sandyclay	Brackish

			5th	177.0	78.5	164.8	Sand	Fresh
			6th	3.8	Infinite	Infinite	Clay	Saline
VES-15	19°46'31"	85°45'36"	1st	28022.0	1.2	1.2	Sandysoil (dry)	Fresh
			2nd	840.2	7.3	8.5	Sand	Fresh
			3rd	240.5	18.4	26.9	Sand	Fresh
			4th	37.4	73.4	100.3	Sandyclay	Brackish
			5th	144.3	96.7	197.0	Sand	Fresh
			6th	5.0	Infinite	Infinite	Clay	Saline
VES-16	19°46'31"	85°45'21"	1st	22200.0	0.8	0.8	Sandysoil (dry)	Fresh
			2nd	1610.0	2.5	3.3	Sand	Fresh
			3rd	262.5	14.7	18.0	Sand	Fresh
			4th	39.9	70.4	88.4	Sandyclay	Brackish
			5th	232.0	90.6	179.0	Sand	Fresh
			6th	4.7	Infinite	Infinite	Clay	Saline

E. Interpretation of VES Results

The true resistivity value and thickness of different formation layers at each site have been interpreted basing on the local geology and hydro-geomorphology of the area. The inferences of the VES tests are as follows:

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a. Top fresh water aquifer zone is expected to occur to a depth range of 18m to 85.4m.
b. Brackish water bearing zones may occur up to depth range of 72.5m to 166m.
c. Another fresh water aquifer zone is expected to occur below the brackish water zone up to a depth range of 164m to 284m.
d. Saline aquifer zone may be encountered at all the sites below the second fresh water aquifer zone.

F. Water Quality Analysis

Water samples have been collected from 10 nos of tube wells of different depth in and around the project area and have been analysed in the Environmental Engineering laboratory of Orissa Engineering College, Bhubaneswar to find its suitability for drinking purpose. It is observed from the water quality analysis report that the chemical parameters are within the permissible limit in almost all the water samples except few. The Fe concentration is found to slightly exceeding the permissible limit of 0.1mg/l in water samples of tube wells of the nearby areas. High concentration of Fe is observed in the shallow tube well in comparison to the deep tube wells. Fluoride concentration does not create any adverse effect to the water quality of the study area but is found to be 2.11mg/l, slightly exceeding the permissible limit in the deep tube wells in the region outside the Shamuka project area. The quality of water in both shallow and deep aquifer is found to be fresh with TDS and chloride value ranging from 170mg/l to 1223mg/l and 21.7mg/l to 226.88mg/l respectively. Sulphate is found to be relatively higher in the deep tube wells than the shallow ones. Hence, the ground water quality of the area is suitable for drinking purposes in general. But water containing higher concentration should not be used for drinking purpose. Primary treatment may be provided before consumption.

Conclusion and Recomendation

The study area is a part of beach sand ridge, where the sand layer forms fresh water aquifer zone. Alternate layers of sand and clay occurs in the area. The top fresh water aquifer is expected to occur up to a depth ranging from 18m to 85m followed by a brackish water bearing zone. Another fresh water aquifer zone is expected to occur below the brackish water zone at a depth ranging from 72.5m to 166m below ground level followed by saline zone, which should be confirmed by exploratory drilling.

Basing on the findings of the above studies recommendations are made as follows:

a. Bore hole logging should be carried out to identify the fresh water zones and to assess the cumulative thickness of productive aquifer before installation of production tube wells.

b. Cement ceiling should be restored carefully to seal off saline zones; otherwise tapping of saline zone may result in contaminating fresh water.
c. Care should be taken not to disturb the hydro-chemical balance of fresh water/saline water zones, which may lead to saline water ingress.
d. Conjunctive use of surface and ground water is needed for optimal use of available water resources.
e. Regular water quality monitoring should be adopted to avoid any hindrance in change of water quality parameters affecting the human health.

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THE END

ARTICLE 8

NUMBER 6 –(NEED FOR TOMORROW)

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Abstract:

After going through the heading and sub-heading you must be having different thoughts regarding the content of the topic. Is it something on numerology, cricket or something else? But I would like to say sorry to all those who think of above mentioned amazing topics because this one is based on your automobile engines and this number 6 refers to six stroke engine. You all must be aware of two and four stroke engines used in cars, scooters, bikes etc. And many great past, present and future engineering minds must have gone through its theory and practical number of times. But how many of you are aware of a six stroke engine? This review paper will take you on a smooth ride with a six stroke engine. I hope you are going to enjoy this ride.

Introduction

Heading directly towards the main topic let just first reconstruct our self on the two known engines i.e. 2-stroke and 4-stroke engine. As we know that almost every car which is in market today works on 4 stroke engine along with several motorbikes and various other mechanical equipments. And talking about 2 stroke engine, we have smaller bikes, snow blowers working on it. Lets see how these two engines are really different from each other.

2-stroke Engine vs. 4-stroke Engine

2-stroke engine works on 2 ways. First, the combustion cycle is completed within a single piston stroke as oppose to two piston strokes, and second, the lubricating oil for the engine is mixed in with the petrol or fuel. In another case, such as small motorbikes, the bike has a secondary oil tank that you fill with 2-stroke oil and then the engine has a small pump which mixes the oil and petrol together for you.

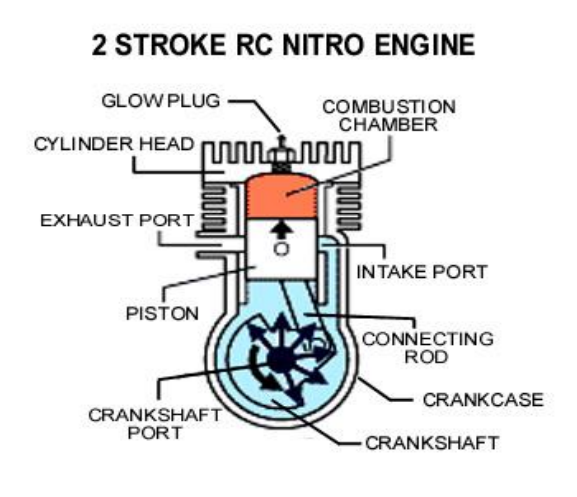

Fig: labeled diagram of 2-stroke engine [1]

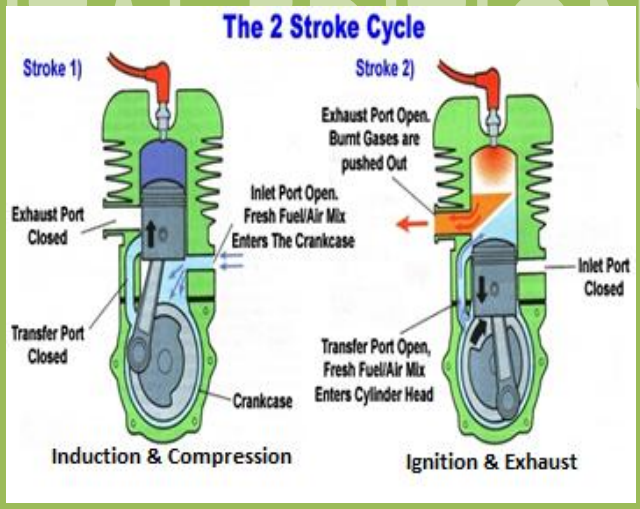

Fig: working of 2-stroke engine [2]

A 2-stroke engine is really simple and its simplicity lies in the reed valve and the design of the piston itself. As we know 2-stroke engine is taller as compared than 4-stroke engine version and also it has 2 slots cut into one side of it. Reed valve is combined with these two slots which allows it to work as it does. For the same cylinder capacity, 2-stroke engines are more powerful than what 4-stroke engines are. One problem with 2-stroke is the pollutants in the exhaust; because oil is mixed with the petrol, every 2-stroke engine expels burned oil with the exhaust. As we know 2-stroke oils are typically designed to burn cleaner than their 4-stroke counterparts but the fact is that 2-stroke engines can be real smoky giants. And also 2-stroke engines are noisy as compared to 4-stroke engines.

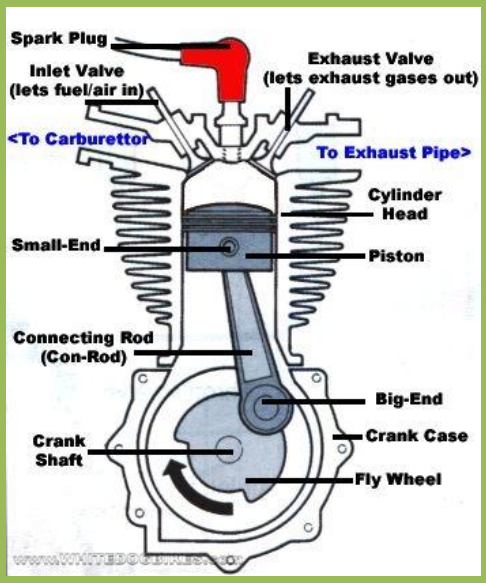

Fig: labeled diagram of 4-stroke engine [3]

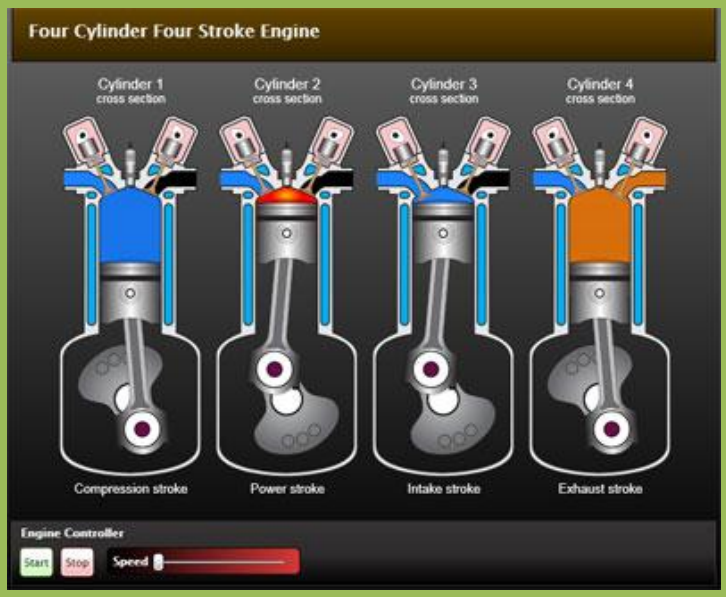

Fig: working of 4-stroke engine [4]

Talking about 4-stroke engines, they are more complex than what 2-stroke engines are. As we are aware of that 4-stroke engine have valve at the top of the combustion chamber. The simplest type has one intake and one exhaust valve. Because of the nature of 4-stroke engines, we won't often find a single cylinder 4-stroke engine. They also take a little longer to start from cold because we need to crank the single piston at least twice before a combustion cycle can start.

Six-stroke engine

The six-stroke engine is a type of internal combustion engine based on the four-stroke engine but a bit more complex to become more efficient and to reduce emissions. There are two approaches to make a six-stroke engine.

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In the first one, the engine captures the heat lost from the four-stroke Otto or diesel cycle and uses it to power an additional power and exhaust stroke of the piston in the same cylinder. In such designs we use either steam or air as the working fluid for the additional power stroke. One point to be noted is that in such type of engines, pistons go up and down 3 times for each injection of fuel. In this one power stroke is with fuel and the other one with either steam or air. Examples for such designs are the Crower six-stroke engine, invented by Bruce Crower of the U.S. ; the Bajulaz engine by the Bajulaz S.A. company of Switzerland; the Velozeta Six-stroke engine built by the College of Engineering, at Trivandrum in India; and the NIYKADO Six Stroke Engine invented by Chanayil Cleetus Anil, NIYKADO Motors, India under patent number IN252642 granted on 25 May 2012.

In the second one, the engine uses a second opposed engine in each cylinder that moves at half the cyclical rate of the main piston, thus giving six piston movements per cycle. This not only has replaced the valve mechanism of a conventional engine but also has increased the compression ratio. Examples of such designs are the Beare Head engine, invented by Australian Malcolm Beare, and the German Charge pump, invented by Helmut Kottmann.

Velozeta six-stroke engine

The velozeta six-stroke engine was developed in 2005 by a group of Mechanical Engineering students of the College of Engineering, Trivandrum. In this engine, fresh air is injected into the cylinder during the exhaust stroke which expands due to heat and therefore forces the piston down for an additional stroke. The valve overlaps have been removed and the two additional strokes using air injection provide for better gas scavenging. There has been dramatic reduction in air pollution and with that 40% reduction in fuel consumption. This engine can run on various fuels like gasoline, diesel, LPG. When it was compared with the four-stroke engine from which it was developed, it showed a 65% reduction in carbon monoxide pollution.

Now if you have gone through it seriously then you must be thinking that how from a four-stroke engine we can develop a six-stroke engine, then don't worry because the further part of the article is really going to help you in understanding this.

We all know that internal combustion efficiency is less than 40%. Most of the energy generated by burning the fuel in the combustion chamber is lost in water cooling and exhaust.
In 2006, Bruce Crower managed to develop the first six stroke engine. Using a modified single-cylinder diesel engine Crower converted it to use gasoline, and then machined the necessary parts to create the world's only six-stroke engine. The engine works through harnessing wasted heat energy created by the fuel combustion to add other two-

strokes to the engine cycle. After the combustion stage water is injected into the super-heated cylinder and a steam form forcing the piston back down and in turn cools the engine. The result is normal levels of power using much less fuel and no need for an external cooling system.
There are two methods when operating six stroke engines, the first method by completely finished the exhaust stoke then inject the water. The second method is by trapping and recompression of some of the exhaust from the fourth piston stroke, followed by a water injection and expansion of the resulting steam/exhaust mixture.

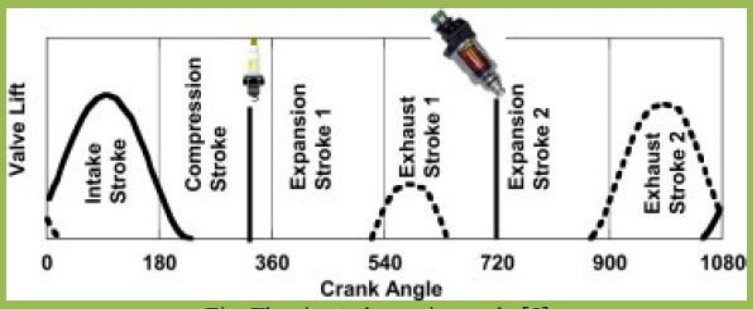

Fig: The six stroke engine cycle [5]

Conklin and Szybist made a theoretical thermodynamics analysis to this six stroke engine using the second method so that they can calculate the effect of this new arrangement on mean effective pressure.
The graph shows an increase in mean effective pressure with the increase of amount of water injected and also with more delaying of exhaust valve cam closing. It was not easy to make six-stroke engine from a conventional engine. There were several modifications that were needed to be done as told by Andrew De Jong. After having a look at the graph we can go through the modifications also.

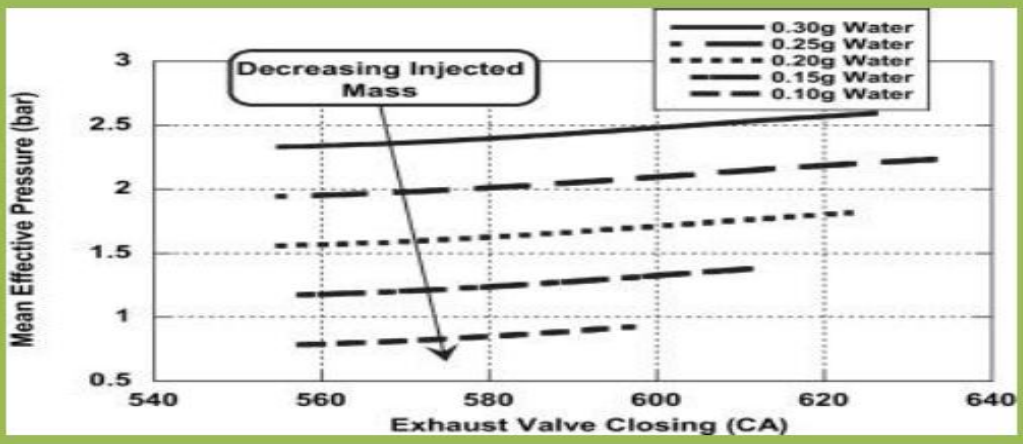

Fig: mean effective pressure due to second expansion with water injection [6]

ENGINE MODIFICATIONS

Crankshaft to camshaft ratio modification

In a four-stroke engine, the gear at crankshaft must rotate 720 degree while the camshaft rotates 360 degree to complete one cycle. However, in a six-stroke engine, the gear at the crankshaft must rotate 1080 degree while the camshaft rotates 360 degree to complete one cycle. Hence their corresponding gear ratio is 3:1 whereas in four stroke engine the gear ratio is 2:1. In six-stroke engine gear at the crankshaft has 18 teeth and gear at camshaft has 54 teeth. The type of gear used is helical because it is suitable for high speed, high power application and quite at high speed rotation.

Fig: crankshaft and camshaft modification [7]

In the six stroke engine the 360 degree of the cam has been divided into 60 degree among the six strokes. The exhaust cam has two lobes to open the exhaust valve at fourth stroke (first exhaust stroke) and the sixth stroke to push out the steam.

Fig: camshaft [8]

Now talking about the cam follower, the bottom shape of regular follower has the flat pattern, which is suitable with the normal camshaft for four stroke engine. When reducing the duration of valve opening from 900 degree to only 600 degree the shape of the follower must be changed from flat to roller or spherical shape.
And after all these modifications the engine was checked and it resulted as a smooth six-stroke engine which was running smoothly with six-stroke cycles.

Conclusion

So, we have arrived at the end of this article but before dropping curtain on this article we can recall all those topics which we have gone through. We differentiated between two most familiar engines to us i.e. 2-stroke engines and 4-stroke engines. After that we went through main topic of this article, six-stroke engine. We learnt about its working, how it differs from any other engine and at end the end we came to know that how by certain modifications we can make a six-stroke engine from a conventional four-stroke engine. I hope this will help you in making new mechanical machines and automobiles that is surely going to reduce our problems related to efficiency, speed and several other aspects affecting the functioning of a machine.

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THE END

ARTICLE 9

ENERGY MANAGEMENT IN MILK PROCESSING PLANT

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Abstract:

In this paper we better understand the problems related to high energy consumption in the milk processing plant and to suggest methods for their active reduction with different approaches to Energy Management applied to a milk processing plant. Major emphasis of the paper is to utilize the outgoing waste process heat and atmospheric heat depending upon regulatory context, product type and resource cost. Overall the most economical method is suggested for preservation of milk at the lowest possible energy expenditure.

Introduction

Pasteurization is the process of the heating liquids for the purpose of destroying viruses and harmful organisms such as bacteria, protozoa, moulds and yeasts. The process was named after its inventor, French scientist Louis Pasteur.

Pasteurization processes: Pasteurization typically uses temperatures below boiling since at temperatures above the boiling point for milk case in micelles will irreversibly aggregate(or "curdle"). There are two types of pasteurization used today.

High temperature/short time(HTST)

There are two methods for HTST pasteurization: batch and continuous flow. In the batch process, a large quantity of milk is held in a heated at 63C(145F) for 30 minutes, followed by quick cooling to about 4C(39F). In the continuous process, milk is forced between metal plates or through pipes heated on the outside by hot water.

Ultra-high temperature(UHT)

UHT processing holds the milk at a temperature of 138C (250F) for a fraction of a second.

Milk simply labeled "pasteurized" is usually treated with the HTST method, whereas milk labeled "ultra-pasteurized" or simply "UHT" must be treated with UHD method.

Pasteurization methods are usually standardized and controlled by nation food safety agencies (such as the USDA in the United States and the food Standards Agency in the United Kingdom). These agencies require milk to be HTST pasteurized in order to qualify for the "pasteurized" label. There are different standards for different dairy products, depending on the fat content and the intended usage. For example, the pasteurization standards for cream differ from the standards for fluid milk, and the standards for pasteurizing cheese are designed to preserve the phosphatase enzyme, which aids in cutting.

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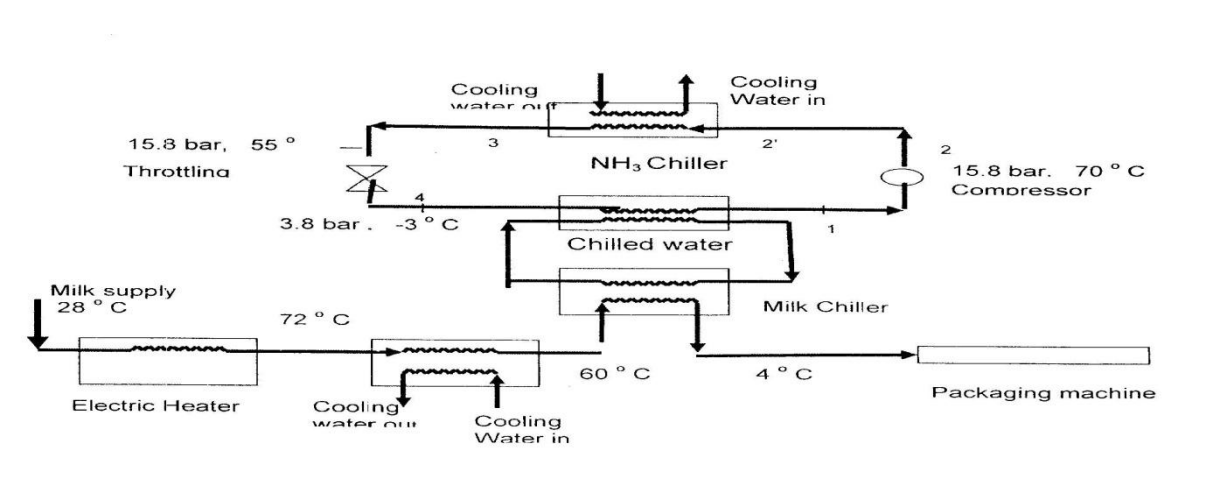
The HTST pasteurization standard was designed to achieve a 5-log reduction (0.00001 times the original) in the number of viable micro-organisms in milk . This is considered adequate for destroying almost all yeasts, mold, and common spoilage bacteria and also to ensure adequate destruction of common pathogenic hest-resistance organisms(including particularly Mycobacterium tuberculosis , which causes tuberculosis and Coxiella burnetii, which causes Q fever). HTST pasteurization processes must be designed so that the milk is heated evenly, and no part of the milk is subject to a shorter time or a lower temperature. The milk is heated to 72C (161F) for 15-20 seconds for the HTST process and then cooled to a temperature of 4C and stored at that temperature.

Methodology

We propose alternative designs for heating and cooling requirement during pasteurization process and then we compare the various alternatives and the existing system on criterion of energy consumed, cost noise generated and location feasibility.

OVERVIEW OF THE EXISTING SYSTEM

Plant: Dairy Technology Department(AAI, Naini)
Plant Layout : Product layout
Plant Capacity : 1500 liters (->150 Liters /hour)
Pasteurization Method: HTST pasteurization (Heating at 72^0 C for 30 sec followed by cooling to 4^0C)
Power Consumed: 0.16792 kW-hr / liter of milk processed
Type of Energy Used : Electrical Energy



Proposed Alternative

After the study of existing system and baseline data collection some alternatives designs for new small sized milk processing plants are proposed for pasteurization processing plants are proposed for pasteurization process and a comparison is done amongst the various alternatives and the existing system on criterion of energy consumed per unit milk processed, in order to bring the milk processing energy cost to a significantly lower value.

Material & Method

Using a Plate Type Heat Exchanger

In this alternative it is suggested to utilize the energy wasted in the form of heat carried by the heated milk going into the chiller unit. The suggested alternative plans to use this heat and the same is used to preheat the milk coming from the supply and hence reduce the heating load required for the purpose of milk processing. This can be done by using a plate type heat exchanger.

- PHE effectiveness : 0.8 (assumed)
- Hot milk temperature entering in PHE : 72^0C
- Hot milk temperature leaving PHE :36.8^0C
- Cold milk temperature entering in PHE : 28^0C

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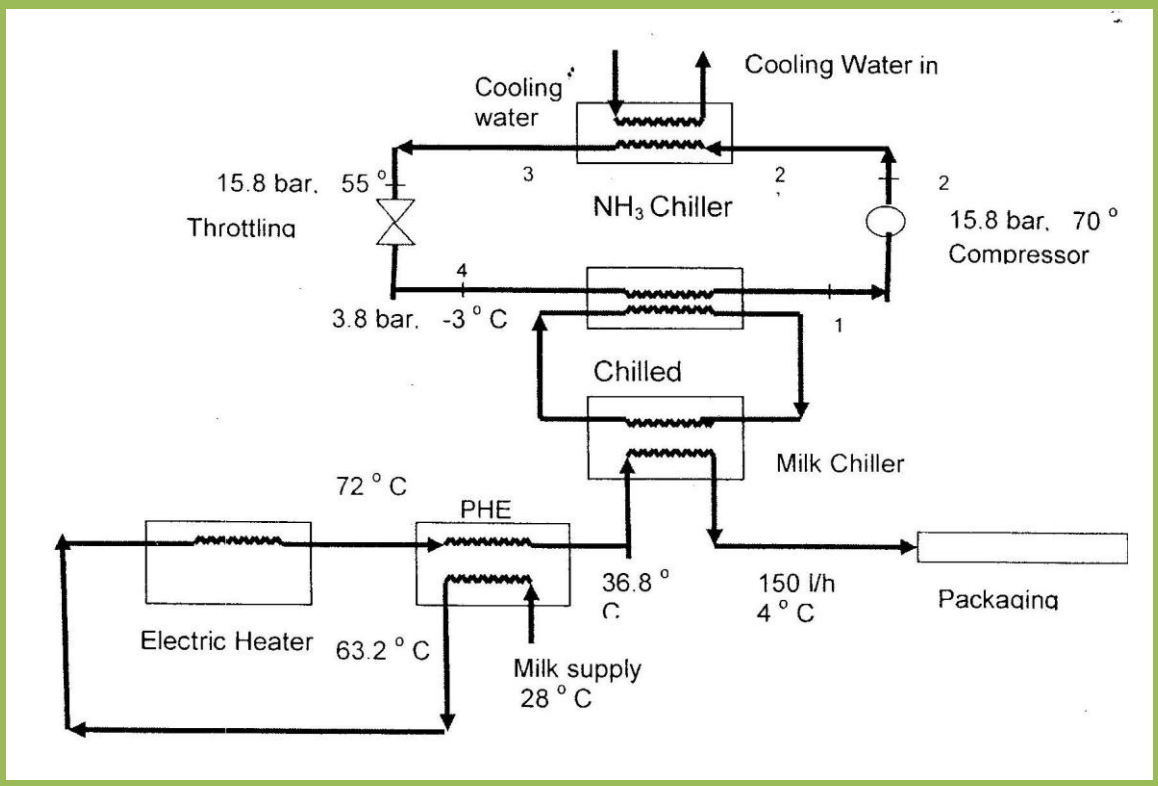
Proposed System's Layout



In actual plant the new installation can be done such that no additional pumps are required. For the purpose of calculating energy needs, the effectiveness of this newly incorporated heat exchanger can be assumed to be 0.8 Using simple heat balance it has been found that electrical power now required (including electricity to run compressor for chilling unit) is 13.3 kW and heat input required is only 1.53 kW.

This reduction in mechanical power input to chilling unit is because of the reduced cooling load and hence the decreased compressor power of the chilling unit because of the fact that in existing system we had to cool down the milk 60^0C to 4^0C but now we have to cool it from 36.8^0C to 4^0C, while the decrease in heat input required is because of the fact that the heating load is raising the temperature of milk from 63.2^0C to 72^0C as compared to that in the existing system where we have to raise the temperature of milk from 28^0C to 72^0C.

Result & Conclusion

Using this method milk processing energy cost per liter can be reduced to Rs. 0.494 per liter. Furthermore average carbon emissions=89 kg per day.

Thus carbon emission saving potential on account of reduced electricity consumption is around 27 CER per year.

In this paper we have presented certain alternatives to reduce the milk processing energy cost. Our results also show that with implementation of certain measures in the dairy industries considerable savings in energy expenditure can be done.

Need for technology diffusion among companies involved in dairy technology is what is required. It is very important that there is technology transfer among dairy firms in view of all depending factors affecting it.

The major reason why Indian dairy sector not catching up with the rest of the world is the fact that India being a developing country has all its potential resources scattered all over and we never figured out how to make the optimum use of these resources by bringing them under one roof. This is what is achieved from this paper i.e implementing simple energy efficient, technologically feasible methods to reduce the milk processing energy cost to minimum.

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ARTICLE

10

LONG-TERM VARIABILITY OF DIFFERENT SOLAR SOURCE ACTIVITIESAND THEIR IMPACT ON THE CLIMATE CHANGE

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Abstract:

This research work mainly focuses on the Comparison of two different breathing techniques namely Deep Breathing Exercise with incentive Spirometery and only Deep Breathing exercises and to see the overall effect of these exercises on the patients operated with Coronary Artery Bypass Grafting. CABG is the operative procedure to cure the patients who are in condition of Coronary artery Blockage. Blockage (plaque) causes the insufficient blood (oxygen) to the heart which ultimately results in intense Chest pain (angina) with other symptoms like Dyspnoea, discomfort which further results into Heart Attack, and other cardiac disorders. For this research two groups of 15 people each were taken and the post operative comparative data has been collected for both the group for four consecutive days. The data obtained were statistically analyzed with student 't' test and with comparative paired 't' test. The result shows Deep Breathing Exercises with incentive Spirometery is more effective than only using Deep Breathing Exercises in preventing pulmonary complications after CABG.

Introduction

The long-term variability of solar activities and their impact on climate change have been analysed. Climate change is a long-term change in the weather patterns over periods of time that may range from decades to thousands of years. The Earth's magnetosphere and upper atmosphere can be greatly perturbed by variations in the solar variations caused by disturbances on the Sun. The state of near-Earth space environment is governed by the Sun and is very dynamic on all spatial and temporal scales. Mechanisms proposed to explain the climate response on solar variations can be grouped broadly into two categories. The first involves to variations in solar radio flux and total solar irradiance (TSI). The second mechanism category involves energetic particles, including solar energetic particle events (SEPs) and galactic cosmic rays (GCRs) etc. Variations in the activity of the Sun greatly influence the physics of the upper atmosphere. The geomagnetic disturbances, occurrence of auroras at low latitudes,sporadic ionization above -80 km altitude, and – as a consequence of the latter - reduced quality of shortwave radio transmissions all appear to follow the approximately 11-year solar activity cycle. This cycle is most distinctly seen in two observed parameters: the sunspot number (SSN) and the 10.7 cm radiation. Total solar irradiance (TSI) has been monitored continuously from space since 1977. The long-term solar irradiance variations might contribute to global warming over decades or hundreds of years. In the present work, we have analysed long-term variations of various solar activities from 1976 onwards and their impact on climate changes. Adverse impacts of climate change and challenges in near future have also been discussed.

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Sunspots are huge magnetic storms that are seen as dark (cooler) areas on the Sun's surface. The number of sunspots peaks every 11 years. There is a strong radial magnetic field within a sunspot and the direction of the field reverses in alternate years within the leading sunspots of a group. So the true sunspot cycle is 22 years. During periods of maximum sunspot activity, the Sun's magnetic field is strong. When sunspot activity is low, the Sun's magnetic field weakens. The magnetic field of the Sun also reverses every 22 years, during a sunspot minimum. There are longer cycles than the 11-year sunspot cycle known as Gleissberg cycle (88-year) with variable amplitudes. The cosmogenic radio nuclides confirm the existence of other longer periodicities (e.g. 208-year DeVries or Suess cycle, 2300-year Hallstatt cycle and others) and also the present relatively high level of solar activity, although there is some controversy (Muscheler et al., 2007; Usoskin et al., 2004; Steinhilber et al., 2008). The Milankovitch theory suggests that normal cyclical variations in three of the Earth's orbital characteristics are probably responsible for some past climatic change. Periods of a larger tilt result in greater seasonal climatic variation in the middle and high latitudes. At these times, winters tend to be colder and summers warmer. Colder winters produce less snow because of lower atmospheric temperatures. As a result, less snow and ice accumulates on the ground surface. Moreover, the warmer summers produced by the larger tilt provide additional energy to melt and evaporate the snow that fell and accumulated during the winter months. In conclusion, glaciers in the polar regions should be generally receding, with other contributing factors constant, during this part of the *obliquity* cycle. The measurements made with a solar telescope from 1976 to 1980 showed that during this period, as the number and size of sunspots increased, the Sun's surface cooled by about 6° Celsius. Apparently, the sunspots prevented some of the Sun's energy from leaving its surface. However, these findings tend to contradict observations made on longer time's scales. Observations of the Sun during the middle of the Little Ice Age (1650-1750) indicated that very little sunspot activity was occurring on the Sun's surface (Eddy, 1976). The Little Ice Age was a time of a much cooler global climate and very little sunspot activity occurring on the Sun.

Solar impact on the Earth's climate in the upper atmosphere interacts most directly with the radiation, particles and magnetic fields emitted by the Sun. Solar signals in the stratosphere are relatively large. Ozone is the main gas involved in radiative heating of the stratosphere. Solar-induced variations in ozone can therefore directly affect the radiative balance of the stratosphere with indirect effects on circulation. Solar-induced ozone variations are possible through: (a) changes in solar ultraviolet (UV) spectral solar irradiance, which modifies the ozone production rate through photolysis of molecular oxygen, primarily in the mid-to-upper stratosphere at low latitudes (Haigh, 1994), and

(b) changes in the precipitation rate of energetic charged particles, which can indirectly modify ozone concentrations through changes in the abundance of trace species that catalytically destroy ozone, primarily at polar latitudes (Randall et al.,2005). In addition, transport-induced changes in ozone can occur (Hood and Soukharev, 2003; Rind et al., 2004; Shindell et al., 2006; Gray et al., 2009) as a consequence of indirect effects on circulation caused by the above two processes. Solar UV radiation directly influence stratospheric temperatures and the dynamical response to this heating extends the solar influence both poleward and downwards to the lower stratosphere and tropopause region. Evidence that this influence can also penetrate into the underlying troposphere is accruing from a number of different sources. One consequence of these solar perturbations is to complicate the detection of human-induced depletion of the protective ozone layer; another may be to perturb the temperature at the Earth's surface, through connections that link the upper and lower parts of the atmosphere.

The galactic cosmic rays increase the amount of C-14 in the atmospheric Co_2 and, consequently, also in vegetation. During the increased solar activity close to solar cycle maximum years, Earth is better shielded from the cosmic rays than during the minimum years, and the amount of C-14 decreases. Thus the C-14 content of, for example, annual rings of old trees may reveal something about the Sun's performance during the last few millennia. Some studies have indicated that there is a connection between long term climate change and Sun's activity (Friis-Christensen and Lassen, 1991; Lassen and Friis-Christensen, 1995). One possible mechanism operating is that during high activity levels the decreased amount of galactic cosmic rays could lead to reduced cloud formation in the atmosphere, and hence to increased temperatures. The basis of the hypothesis of Svensmark et al. (2009) is that weak solar activity causes a weak solar wind, which in turn increases the number of galactic cosmic rays penetrating the Earth's atmosphere. This increases low level cloud formation and the Earth's albedo. The Earth cools as a consequence.

Long-term variability of total solar irradiance (TSI)

The total solar irradiance (TSI) is integrated solar energy flux over the entire spectrum which arrives at the top of the atmosphere at the mean Sun-Earth distance. The TSI observations show variations ranging from a few days up to the 11-year sunspot cycle and longer timescales (Lockwood and Fröhlich, 2008). TSI has been monitored from 1978 by several satellites, e.g. Nimbus 7, Solar Maximum Mission (SMM), the NASA, Earth Radiation Budget Satellite (ERBS), NOAA9, NOAA 10, Eureca and the UARS (Upper Atmospheric Research Satellite) etc. The Solar Radiation and Climate Experiment (SORCE), a NASA-sponsored satellite mission was launched to measurements of TSI. SORCE carries four instruments including the Spectral Irradiance Monitor (SIM), Solar Stellar Irradiance Comparison Experiment (SOLSTICE), Total Irradiance Monitor (TIM), and the XUV Photometer System (XPS). The TIM is TSI measurements monitor the incident sunlight to the Earth's atmosphere using an ambient temperature active cavity radiometer. The historical reconstruction of more recently accepted TSI absolute value is described by Kopp and Lean (2011) based on new calibration and diagnostic measurements by using TIM V.12 data on 19th January 2012, and is updated annually. The historical reconstruction of TSI is shown in **Figure 1**. From the plot, it is find that decadal TSI variation trend follows with sunspot number within a limit, except Maunder Minimum period. The centurial variation trends of TSI have not shown clear association. Surface temperatures and solar activity both increased during the past 400 years, with close associations apparent in pre- and post-industrial epochs (Hoyt and Schatten, 1993; Lean et al., 1995; Reid, 1997). However, the inference from correlation studies that Sun-climate relationships can account for a substantial fraction of global warming in the past 150 years is controversial.

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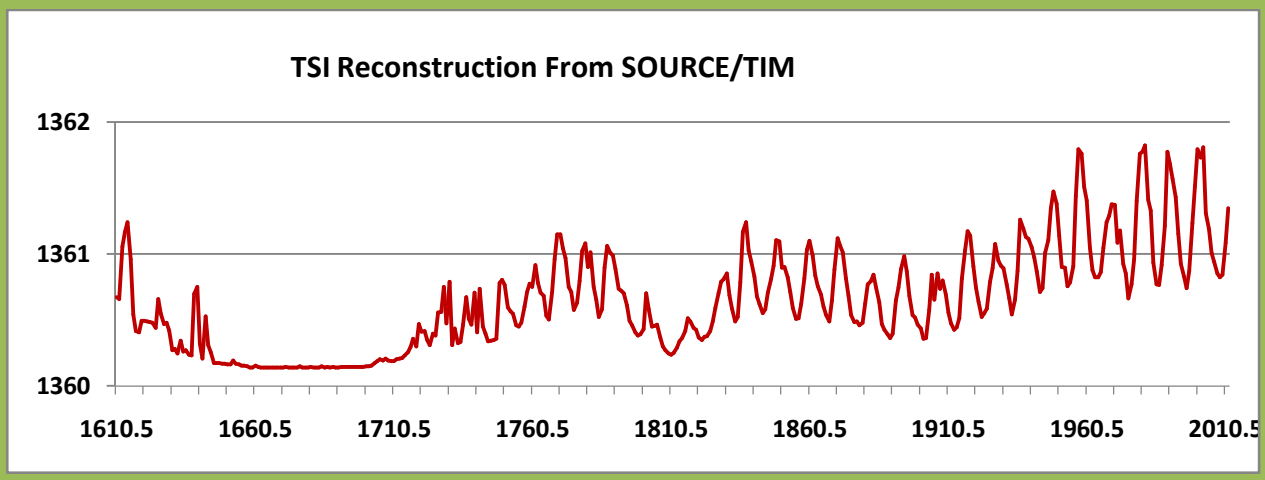

Figure 1:Shows the long-term variation historical reconstruction of TSI absolute value computed by G. Kopp on 19th January 2012

TSI are known to be linked to Earth climate and temperature. Accurate TSI measurements from the last 25 years are correlated with sunspots and faculae. These correlations can then be used to extrapolate the TSI to time periods prior to accurate space-borne measurements, since the solar records extend back 100 years for faculae and 400 years for sunspots. Proxies of the TSI based on sunspot observations, tree ring records, ice cores, and cosmogenic isotopes have given estimates of the solar influence on the Earth that extend back thousands of years, and correlate

with major climatic events on the Earth. This extrapolation is important for understanding the relationship between TSI and the Earth's climate. The variation of TSI measured by several satellites (composite) from 1976 onwards and their association with yearly mean sunspot number (SSN) is shown in **Figure 2**. The data of total solar irradiance (TSI) were taken from SOURCE website (http://lasp.colorado.edu/sorce/index.htm) computed by Kopp and Lean (2011). From this plot, it is find that variation trend of TSI follows with 11-year sunspot cycle during the period 1976 onwards.

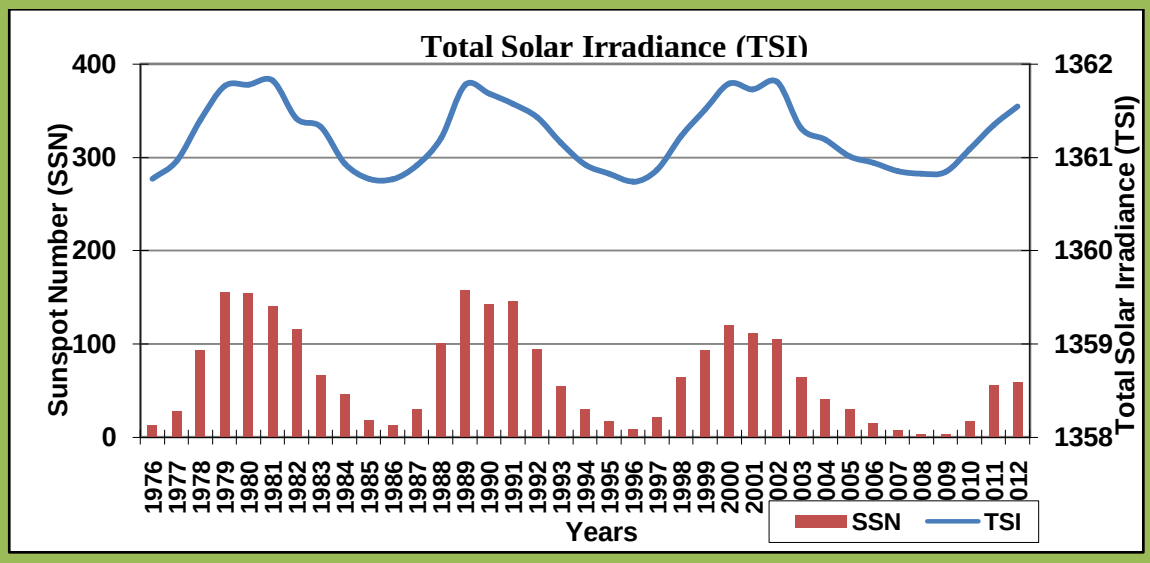

Figure 2: Shows the variation of TSI measured by several satellites (composite) from 1976 onwards and their association with yearly mean sunspot number.

Long-term variability of solar energetic particle events (SPEs)

The solar energetic particle (SPEs) events are the energetic outbursts as a result of acceleration and heating of solar plasma during SFs and CMEs. SPEs events associated with SFs are called impulsive where as those associated with CMEs are gradual. SPEs events occur when high-energy protons are ejected from the Sun's surface during fast solar eruptions and causes geomagnetic and ionospheric disturbances on large scale. These effects are similar to auroral events, the difference being that electrons and not protons are involved. These events typically occur at the north pole, south pole, and South Atlantic magnetic anomaly, where the Earth's magnetic field is lowest. The more severe SPEs events can cause widespread disruption to electrical grids and the propagation of electromagnetic signals. Occurrence of SPEs events are varies with 11-year sunspot cycle. In the present section, we investigate the association of SPEs events on long-term basis. An association of occurrence of SPEs events (E ≥10 MeV) with 11-year sunspot cycle is plotted in **Figure 3**. We haven't shows very significant associations between the yearly occurrences of SPEs events with 11-year sunspot cycle except solar cycle 22. SPEs events are an important cause to produce geomagnetic and ionospheric disturbances on large scale. The more severe SPEs events can cause widespread disruption to electrical grids

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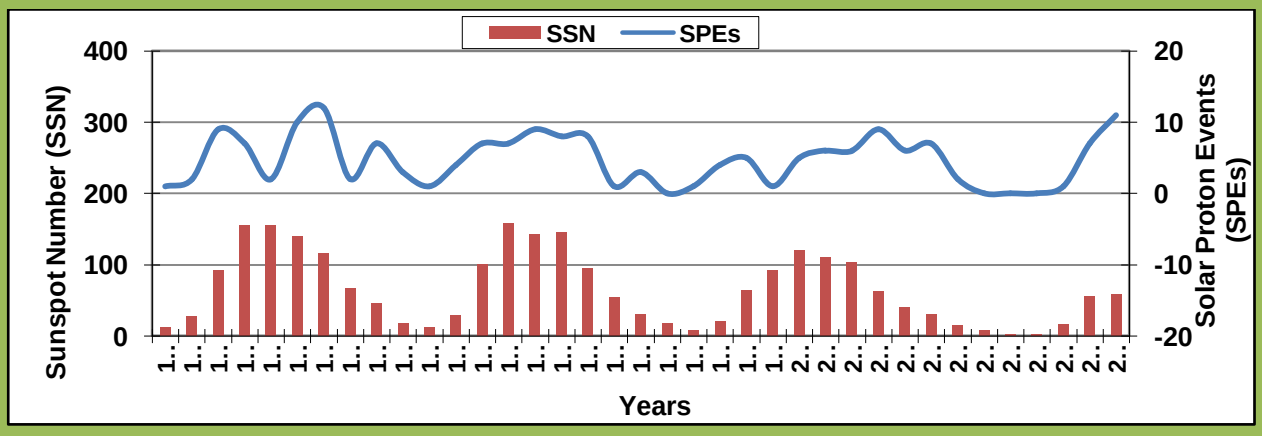

Figure 3: Shows the association of SPEs Events (E ≥10 MeV) and their association with 11-year sunspot cycle, observed during the period 1976 onwards.

Long-term variability of solar radio flux (SRF)

The Sun emits radio energy with slowly varying intensity. This solar radio flux (SRF), which originates from atmospheric layers high in the Sun's chromosphere and low in its corona, changes gradually from day to day in response to the number of sunspot groups on the solar disk. SRF from the entire solar disk at a frequency of 2800

MH_z has been recorded routinely by radio telescope near Ottawa since February 1947. Associations of SRF with annual mean SSN for the period 1976 onwards are plotted in **Figure 4**. We find that the yearly occurred value of SRF varies with 11-year sunspot cycle as similar as variation of solar transients. A difference between the first and second maxima for solar cycle on the one hand and SRF on the other is intriguing. If the radio emission is associated with sunspots, the relative values of the first and second maximum should be similar, at least qualitatively, for both. However, decimetric frequencies would be from bremsstrahlung and may not follow sunspots. Between the radio emissions themselves, there is no consistency.

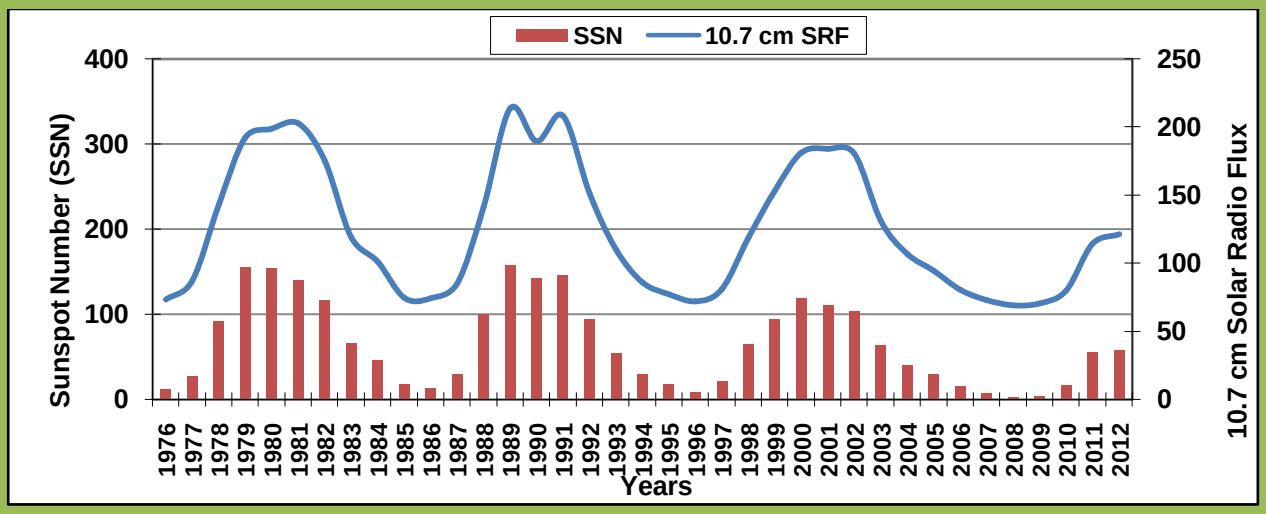

Figure 4: Shows the association of solar radio flux 10.7 cm/2800 MHz and their association with 11-year sunspot cycle, observed during the period 1976 onwards.

Climate change and global warming

The basic components that influence the Earth's climatic system can occur externally (from extraterrestrial systems) and internally (from ocean, atmosphere and land systems).The external change may involve a variation in the Sun's output. Internal variations in the Earth's climatic system may be caused by changes in the concentrations of atmospheric gases, mountain building, volcanic activity, and changes in surface or atmospheric albedo. The basic causes of increase in global temperature can occur from variation in TSI and human made activities (mainly emission of Co_2). Atmospheric carbon dioxide (Co_2) is an important kind of greenhouse gas which influences global temperature. Its concentration variation could indicate the distribution of human and natural activities in various regions. The amount of Co_2 that can be held in oceans is a function of temperature. Co_2 is released from the oceans when global temperatures become warmer and diffuses into the ocean when temperatures are cooler. Initial changes in global temperature were triggered by changes in received solar radiation by the Earth through the Milankovitch cycles. The increase in Co_2 then amplified the global warming by enhancing the greenhouse effect. The long-term climate change represents a connection between the concentrations of Co_2 in the atmosphere and means global temperature. Certain atmospheric gases, like carbon dioxide, water vapor and methane, are able to alter the energy balance of the Earth by being able to absorb long wave radiation emitted from the Earth's surface. Without the greenhouse effect, the average global temperature of the Earth would be a cold -18° Celsius rather than the present 15° Celsius. Co_2 concentrations in the atmosphere have increased from about 280 ppm in pre-industrial times to 389 ppmv at present. The variation of Atmospheric carbon dioxide (in ppmv) collected at Mauna Loa, Hawaii and their association with global surface temperature (GSTemp) during 1976 onwards are plotted in **Figure 5**. The data of global surface temperature (GSTemp) have been taken from National Aeronautics and Space Administration, Goddard Institute for Space Studies. From the plot, it is find that that the rate of concentration of atmospheric Co_2 and global surface temperature both are increasing continuously during above mentioned periods.

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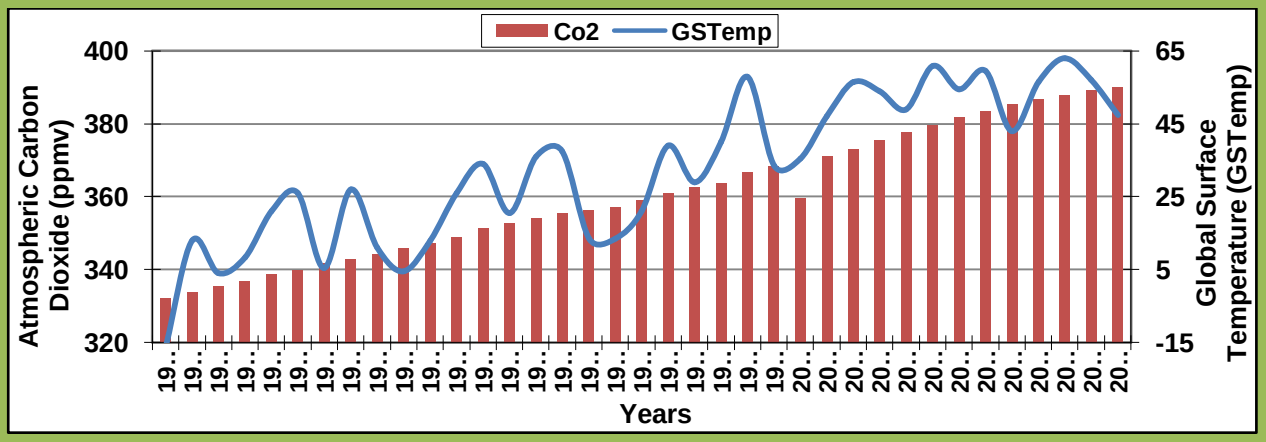

Figure 5:Shows the variation of Atmospheric Co_2 (in ppmv) collected at Mauna Loa, Hawaii and their association with global surface temperature (GSTemp) during 1976 onwards.

The effect of global surface temperature is increasing the average temperature of the Earth. A rise in Earth's temperatures may boost the occurrence and concentration of severe climate events, such as floods, famines, heat waves, tornados, and twisters. Other consequences may comprise of higher or lower agricultural outputs, glacier melting, lesser summer stream flows, genus extinctions and rise in the ranges of disease vectors. As an effect of increase in global surface temperature species like golden toad, harlequin frog of Costa Rica has already become extinct. There are number of species that have a threat of disappearing soon and various new diseases have emerged lately. The increase in global surface temperature is extending the distribution of mosquitoes due to the increase in humidity levels and their frequent growth in warmer atmosphere. Various diseases due to ebola, hanta and machupo virus are expected due to warmer climates. The effect of increase in global surface temperature will definitely be seen on some species in the water. A survey was made in which the marine life reacted significantly to the changes in water temperatures. It is expected that many species will die off or become extinct due to the increase in the temperatures of the water, whereas various other species, which prefer warmer waters, will increase tremendously. The increase in global surface temperature is expected to cause irreversible changes in the ecosystem and the behavior of animals. Based on the study on past climate shifts and computer simulations, many climate scientists say that lacking of big curbs in greenhouse gas discharges, the 21st century might see temperatures rise of about 3 to 8º C, climate patterns piercingly shift, ice sheets contract and seas rise several feet. The IPCC (2007) suggests that if sea level rise could convert as much as 33% of the world's coastal wetlands to open water by 2080.

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THE END

ARTICLE

11

THE STUDY OF FEMALE CHARACTERS IN BINODINI

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Abstract:

Binodini that has been hailed as the first phychological novel has arrested the attention of critics like Masti Venkatesa Krishna Kripalani, P.C. Majumdar, Niharranjan Ray and Bimanbehari Majumdar for various reasons. R.C. Majumdar comments; "Rabindranath relied upon the detailed phychological method in which incidents and intention are marshalled in a close array and every step in the evolution of the story and character is subjected to a process of a minute analysis." (1969: 916) Krishna Kripalani feels that within this novel, Tagore has "laid out the foundation of the modern in Indian literature." (1962:186) Niharranjan Ray comments that with this novel Tagore "struck out a new path for the further development of the Bengali novel on still refreshing lines." (1961:165)

Introduction

Binodini

The problems of the young widow and the humiliation which she is subjected to by the society are the theme of the novel. Though the narrative content of *Binodini* is very limited, Tagore succeeded in enhancing the small story to epic heights by projecting the yearning, frustration and misery of Binodini with sympathy and solicitude. Binodini is the only child whose father, inspite of his limited resources, engaged an English governess to educate his daughter at home. In this respect Binodini is very fortunate to receive modern education because the education of women was not in vogue at that time. Moreover she is attractive girl with many accomplishments. Inspite of these qualities the marriage of Binodini is a problem for her mother owing to lack of money.

His father died without saving enough money for her dowry. Hence, the widowed mother tries to get her married to Mahendra, the only son of Rajyalakshmi who was her playmate in her village. But Mahendra refuses to marry her because he thinks that the new bride may oust his mother. Rajyalakshmi then arranges her marriage with her distant cousin "whose only claim to distinction was his excessively enlarged liver." (Tagore1959:24) So there is no doubt that Binodini soon becomes a widow and is condemned to a life of misery and misfortune in a remote village. Meanwhile, on an emotion and against the wishes of his mother Mahendra marries Asha who is the niece of his aunt Annapurna. The bride has no arresting feature, she is illiterate and an orphan brought up by her uncle.

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Rajyalakshmi goes to her native village owing to unable to bear the sight of her son's luxuriousness. There she is pleased by Binodini's hospitality and treatment. She is so charmed by her that she brings Binodini with her to Calcutta at the time of returning home. Binodini, a rare combination of beauty, grace, dignity and intelligence wins the admiration of all including Bihari. The simple minded Asha too is "so overawed by her beauty and grace and the piercing intelligence of her eyes that she lacked the courage of make an effort towards better acquaintance." (Ibid: 34) The more Asha sees Binodini the more she feels inferior to her. The old fashioned Rajyalakshmi also is highly pleased with Binodini for her cooking, demeanour and speech. She expresses her repentance for not making Binodini her daughter-in-law. At the same time, Bihari regrets for rejecting the offer to marry Binodini and says – "I admit I was wrong. And yet it is better to lose by not marrying than to lose by marrying wrongly." (Ibid: 25)

Though Binodini is brought up in a village, she is skilful in all the household arts like cooking, knitting and interior decoration. The ease and spontaneity of her movement and alertness in attending to the needs of the inmates of the house compel admiration. When Bihari is Binodini's guest along with Rajyalakshmi in her village, he is amazed to find his room "done and every thing neatly and tidily arranged, fresh flowers and leaves in a brass vase and some volumes of Bankim and Dinabandhu placed near his bed." (Ibid: 25) In the same way, Mahendra too praises her skill in household duties and notices it at the absence of Asha. One day, he is amazed to find his room and says – "the room smelt sweet with the perfume of sandal wood incense. The mosquito net had a frill of pink silk which hung over a spotlessly white bed cover." (Ibid: 98) After Binodini has taken charge of Mahendra's house, everything is well-maintained and well-regulated. "The previous disorder and shabbiness were replaced by neatness and order." (Ibid: 49)

Inspite of her accomplishments, Binodini has tender feeling of love and sympathy. She has no jealousy or ill-will towards Asha in the beginning of the story. She loves her as a true friend and assists her in dressing up and in household work. She is shocked when Mahendra unjustly accuses Bihari for making love with Asha on the sly. Her shock is so deep and penetrating that she consoles Bihari like a mother who "rocks the sick child in her arms, so Binodini rocked the unhappy image in her heart." (Ibid: 89) She is the icon of love and sympathy. She has love and respect for Rajyalakshmi. After looking after the sick Rajyalakshmi and discharging the household chores she joins Mahendra and Asha in their revelry. She also looks after the servants with care and sympathy when they are ill.

She has discernment to study the minds and psychology of the people around her. Though she has a fair assessment of Bihari in the beginning of the story, she too like Mahendra suspects Bihari's secret love affair with Asha later on. Similarly she makes a correct estimate of Rajyalakshmi to whom she firmly says that she is responsible for the moral ruin of her son. She accuses her in the following way – "Didn't you ever, out of spite

against your daughter-in-law, wish this seductress to divert your son's mind? Look within yourself and see if it is not so!" (Ibid: 135) She makes a right judgement of Mahendra's character and understands his infidelity and meanness. Hence she comes close more and more towards Bihari. She is sure that Mahendra has "neither the guts to love nor the guts to do your duty." (Ibid: 136)

To explore her multi-faceted personality and to evaluate her character correctly, general qualities of Binodini and the various stages of her love entanglement have to be studied. The entry of Binodini into the life of Mahendra starts the love triangle and Bihari adds the fourth dimension. Her arrival determines the beginning of disaster in the lives of Mahendra, Asha, and Bihari. Binodini's reading a letter written by Mahendra to his friend Bihari begins the first stage of the love entanglement of Binodini. In that letter Mahendra describes the romantic thrill of his conjugal life that reminds her own physical and emotional pleasure of married life. The letter also creates curiosity in her mind regarding Mahendra and Asha. This stage of curiosity is gratified when she comes to their house in Calcutta. She becomes so intimate to Asha that they become close friends. Further, Binodini gratifies lascivious longing for conjugal love by listening to marital bliss described by Asha. So advanced their intimacy is that Asha calls Binodini affectionately by her pet name 'Eye sore.'

This stage of curiosity is followed by jealousy in the mind of Binodini who feels that she has been cheated of all good things in life. Hence she laments – "This happiness, this passionate ardour of the husband was my due and should have been mine …. I could have ruled this house like a queen, could have made the household and the husband into something wonderful from the present shabby, silly state. What I was denied and deprived of now belongs to this slip of a girl, this little play doll." (Ibid: 37) Binodini's ego is hurt when Mahendra pretends to be indifferent towards her though she is living in his house for a long time. Binodini's feeling is expressed in these lines – "Why this difference? As though she was a piece of furniture! Wasn't she human, was not she a woman? If only he came to know her, he would see the vast difference between her and pet Chuni." (Ibid: 42)

Binodini plans to avenge her humiliation by entrapping Mahendra. But she has no deliberate plan to spoil the married life of Asha and Mahendra-- "the nature of her own feeling towards Mahendra was not clear to her. She had not forgotten that he had spurned her hand in marriage and deprived her of her right to love and happiness. Did she hate him for it and sought to avenge her wrong, or did she love him and wanted to offer herself in self-surrender? All she knew was that she was being consumed by a passionate flame inside her, whether of hate or of love or of both she could not say. Do I wish to die or to destroy? Am I the hunter or the hunted? I wish I know." (Ibid: 67) This seesaw of the conflicting sentiment and emotion of Binodini clearly proves that she is by nature a heartless and scheming seductress.

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When a cleavage between Bihari and Mahendra occurs, the second stage starts in the evolution of Binodini's personality. This stage discloses the gradual change of feeling and impression of Binodini and Bihari for each other. Early in the story Bihari realises that "Binodini was not a girl to be either trifled with or ignored." (Ibid:39) Similarly Binodini also feels that Bihari is not a person to be fooled easily. Bihari tells Binodini in the very presence of Mahendra that he (Mahendra) was "Petted and spoilt by his mother and by his friends." And Asha carries on the process. He advises Binodini, "Turn your attention elsewhere instead of aiding and abetting his downfall." (Ibid: 51) Similarly he warns Mahendra by saying – "Binodini is deliberately trying to seduce you and you like a fool are playing into her hand." (Ibid: 53)

The picnic to Dum-Dum garden with Mahendra's family along with Binodini is a turning point to change Bihari's impression about Binodini. This picnic assists Bihari to learn about Binodini's past. He understands for the first time that "Binodini looks a gay butterfly but deep inside her burns the austere light of a pure and devoted woman." (Ibid :60) He feels that he looks at an altogether different person. Mahendra becomes jealous owing to the sympathetic understanding between Bihari and Binodini. Hence he irritates when Bihari comes to his house. It does not prick his conscience to accuse Bihari that he is in love with his wife Asha on the sly Binodini understands the baser side of Mahendra's character and this enhances her admiration for Bihari.

The third stage of Binodini starts with the reversal of Bihari's opinion about Binodini and her increased admiration for him. During Asha's absence from Calcutta, Binodini looks after Mahendra on request of Asha and Rajyalakshmi. This provides an opportunity to Binodini to study the character of Mahendra more thoroughly. Her contempt and hatred for Mahendra is enhanced when Mahendra says mockingly that she might be reading a letter from Bihari keeping it in the novel *Vishavriksha*. She retorts – "A jest! At whose expense? Were you worthy of his friendship, I could forgive your jest. But you are too mean. You are incapable of friendship and yet you have the cheek to gibe." (Ibid: 107) At this point, Bihari enters the room and witnesses the sight of Mahendra clasping the feet of Binodini when she was about to sweep out of the room in a fury. Bihari enters the room to apologise to Mahendra about his visit to Kashi without knowing Asha's presence there. The cleavage between them is complete when Mahendra insults Bihari.

Bihari's feeling of Binodini is shattered into pieces by this scene and at the same time enhances Binodini's regard and love for Bihari. For this reason the wound imposed by Bihari appears very sacred to her when he flung her away violently in a gesture of contempt. She does not permit Mahendra even to touch the wound and she does not apply anything to heal it. After that her love for Bihari changes into devotion. So when Mahendra confesses his love to Binodini, she retorts – "At one time you thought you were in love with Asha. It is false. Now you imagine you

are in love with me. That too is false. You love only yourself." (Ibid: 132) Inspite of Binodini's insult Mahendra pursues her with repeated declarations of love. That impels her to tell Bihari, "Mahendra is in love with me….I have come to you for protection." (Ibid: 144) Bihari is unable to understand the irksome situation in which Binodini is placed. He feels that her behaviour is melodramatic and theatrical. Hence he denies her request for a kiss to keep as "a moment's memory to cherish till my death." (Ibid: 143)

The last and fourth stage of her love begins with her penance for the fulfilment of her love for Bihari. As per Bihari's order she returns to live in her village where her life becomes miserable by the neighhours. Mahendra follows her even to the village. To avoid the unbearable situation she agrees to go with Mahendra on the promise that he would not do anything against her wishes. She does not even allow him to go to the railway station with her in the carriage but asks him to go on foot. She goes with him to Calcutta in order to find Bihari. After a long struggle, Binodini is able to locate the villa in Allahabad where Bihari lived for a short time. Towards the end of the play when Bihari comes to Allahabad in search of Mahendra to take him to attend on his ailing mother, he finds Binodini in a room in the villa bedecked with flowers. Binodini tells him about all the events since her elopement with Mahendra and proclaims that she did not defile herself but "remained chaste. Your image, hard and severe ordering me into exile – this image I have carried in my heart, hard and severe like burnished gold, like a precious stone….I touch your feet and swear that nothing has happened to destroy this value." (Ibid: 217)

Believing every word she utters Bihari offers to marry her who does not accept him with a spirit of self-abnegation. "These words be my final rewards. I want nothing more than what you just affirmed. If I took more it would not lost. Religion and society would never tolerate it." (Ibid: 218) Many critics confuse Binodini's renunciation at the moment of her life's triumph. They think that Tagore does not allow Binodini to be married again for the lack of courage. But the thing is not so and this charge has been refuted by Bimanbehari Majumdar who points out that "Tagore in the story Tyage (Renunciation) written as early as 1982 allowed the heroine, Kusum, a Kayastha widow to marry Hemanta, a Brahmin youngman." (1968:126) Tagore feels that if the novel ends in her union with Bihari, it would be a melodrama. He has created Binodini as the most powerful character who ushers the emergence of a new class of emancipated Indian women who are no longer prepared to be downtrodden by society but fight to assert their rights.

Asha

Asha, the wife of Mahendra, who is simple, meek, charming and innocent woman, is portrayed as a foil to Binodini. She is a traditional Hindu woman who worships his husband. She is an instance of an innocent and simple-minded woman who can be deceived by her husband and by the people around her. Tagore points out through the character of Asha how bitter sorrows and sufferings can transform a simple, artless and impractical woman into an efficient and able mistress of the household. Asha, an orphan brought up by her uncle Anukul Babu, is a favourite niece of her aunt Annapurna. Her uncle who is aware of his prestige did not permit Annapurna to bring her up. As he has his own unmarried daughters, Anukul Babu is anxious to get rid of Asha by arranging her marriage soon, without having to give a dowry. Hence Annapurna who always thinks of Asha's welfare, arranges her marriage with Bihari but all her plan ends in smoke owing to Mahendra's insistence on marry Asha who is considered as paragon of beauty. Asha with her graceful, sweet and charming looks creates a favourable impression on both Bihari and Mahendra. Mahendra is so charmed by her sweetness that he readily changes his previous decision of postponing his marriage. To marry her he is ever prepared to break his friendship with Bihari who also feels that her nature must be as nice as her looks.

After her marriage, Asha does nothing but abides by the order and instruction of her husband. She does not have any knowledge how to behave like a traditional daughter-in-law in a joint family. She has also no knowledge to please the mother-in-law and dominate the house. Neglecting her household duties, she spends most of the time with her husband who takes pleasure in love making, neglecting his medical studies. He always keeps close to her on the plea of educating her. Hence Annapurna insults Mahendra – "would you rather have her modern girl, lazily lounging about the whole day, reading novels or doing fancy knitting, waited upon by other." (1959: 14)

Asha irritates to the two elderly women namely Annapurna and Rajyalakshmi in the house by spending too much time with her husband. Hence Rajyalakshmi leaves for her village and Annapurna leaves for Kashi. Asha is not skilful in household duties and interior decoration and stands as a foil to Kamala of *The Wreck*. She is akin to Hemnalini of the same novel and Urmimala of *Two Sisters*. After going away of Raiyalakshmi and Annapurna her trouble begins. Her mismanagement of the house reaches its climax when Rajyalakshmi comes back from village with Binodini. A simple-minded Asha can not understand the risks of having another woman. She out of simplicity introduces Binodini to her husband. As Rajyalakshmi remarks – "But for her (Asha) silliness, Mahendra would never have fallen into Binodini's clutches." (Ibid: 174) Asha suffers from an inferiority complex and magnifies her drawbacks. This complex increases when she meets an extrovert like Banidini who makes the full use of this opportunity. Asha is very shy by nature and can not mix freely with everybody. On the other hand, Binodini carefully manages all household affairs and take care of personal comfort of Mahandra and Rajyalakshmi. The way she maintains all the domestic duties confirms Asha's own estimate of herself as "congenitally slow-witted and inapt and incapable of doing anything smartly." (Ibid: 63)

Unlike Binodini Asha who is sober woman is a queen of emotion. Hence she does not suspect anybody around her. But she fails to judge Bihari and avoids his company. Binodini points out this defect in Asha by telling her that it is her "misfortune that you can not estimate the worth of a Lakshmana like brother-in-law." (Ibid: 78) At

the same time she is not able to understand the weakness of her character and out of simplicity she lets Binodini to look after her husband during her absence so that he is not put to any discomfort. Similarly she fails to judge her cunning mother-in-law who inspires Binodini to allure Mahendra.

Asha realizes her husband's true character after going through a Binodini's letter to her husband where she admonishes him. That is the turning point of her character. She does not break down after the elopement of her husband with Binodini. Rather she rises to the occasion and affirms her position in the house. Even she is able to win the sympathy and love of her mother-in-law. She treats he husband with contempt -- "She could no longer worship as god the husband who had degraded the purity of married life." (Ibid: 172-173) Hence she consigns his image "to the turbid waters of Binodini's dark passion as Hindu devotee consigns the image of goddess Durga to the river." (Ibid: 173) She separates from Rajyalakshmi in the belief that it is "the duty of the wives to keep to the straight path." (Ibid 174) Asha does not make any further attempt to bring back her husband's affection and love; rather she cannot endure his presence. When he looks into her note book and kept on the table she feels like tearing up those pages as they have been defiled by his touch.

In place of feeling self-pity, Asha tries to improve herself by reading and writing. She who could hardly read *Charupath*, the Bengali primer, now reads novels and journals with interest. Asha looks after her mother-in-law at the time of illness. When Mahendra asks her mockingly whether he has to learn medicine from her, her reply is "not medicine but solicitude for your mother you may well learn from me." (Ibid: 182) Mahendra is shocked at such brilliant repartee from his wife whom he regards as simple, innocent woman. Asha retains the same strength of character when Bihari brings Mahendra from Allahabad to attend to his mother on her death-bed. Se does not allow Mahendra to enter the room saying – "Let Bihari Thakurpo come and see her first. Whatever he advises shall be done." (Ibid: 219) At the same time, she is able to make correct estimate of Bihari whom she hates before. On the other hand, Bihari also notices that Asha "was no longer a raw young girl, the baptism of sorrow has made her ageless like the paragons of chaste womanhood of which the legends speak." (Ibid: 202 – 203) Mahendra also realizes that a kind of change has taken place in her. Bimanbehari Majumder rightly says – "The transformation of Asha from a simple, artless and incompetent to an efficient mistress of the household commanding respect from every one concerned is one of the chief attractions of the novel." (1968: 216)

Rajyalakshmi

Rajyalakshmi is the mother of Mahendra who is a selfish and pompous lady who loves her son blindly, being a widow. Her love for her son is so intense that he becomes obstinate and impetuous. She is akin to Harimohini of *Gora* in cunningness and jealousy. She is satiric like Bara Rani of *The Home and the World.* Being an embodiment of jealous and ill-feeling, she differs from Annapurna, her sister-in-law who is a paragon of virtue and kindness. The two sisters-in-law are closely related to each other from childhood and living the same house. They also share their joys and sorrow each other. The rift of their relation begins when Mahendra attains adolescence because Mahendra gives importance the judgement of Annapurna more than his mother. Hence her attitude towards her widowed sister-in-law becomes bitter. This has been worse when Mahendra marries Asha, the niece of Annapurna. Rajyalakshmi's dislike to Annapurna enhances as she understands that she cannot prevent her son Mahendra from marrying Asha inspite of her open disapproval of the match.

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Like the traditional Hindu mother-in-law, Rajyalakshmi considers her daughter-in-law as an unexpected intruder into her house where she forces Asha to carry out all household drudgery. Mahendra gives vent his anger for the exploitation of his wife. He laments to Annapurna – "The way mother is teating the poor girl to death is scandalous … Intolerable." (Ibid: 14) After Mahendra's marriage, she is no longer able to influence on her son. Hence unable to confront her son, Rajyalakshmi is irritated in Annapurna who is in dilemma between the mother and son. Being unable to endure the gibes and taunts of Rajyalakshmi, she decides to leave the house for Kashi. Thus, Rajyalakshmi loses not only Annapurna but also the affection of Mahendra and Asha. She acts as an instrument in bringing about the love entanglement of Mahendra with Binodini who brings Binodini to Calcutta as she is pleased by her service when she visits the native village. She expresses her repentance to Binodini in the following way – "why didn't I have you as my daughter-in-law? How I would have cherished you, kept you always clasped to my heart." (Ibid: 26)

Such confession leads Binodini to command everyone in the house, from the master to the servant. Rajyalakshmi even inspires Binodini to seduce Mahendra. When Asha is away at Kashi to visit her aunt she instructs her to look after him. In this way, she makes a golden opportunity for Binodini to come close with Mahendra. She understands the game of Rajyalakshmi and at the final reckoning she confronts Rajyalakshmi thus – "Didn't you ever, out of spite against your daughter-in-law, wish this seductress to divert your son's mind." (Ibid: 135) Rajayalakshmi considers Bihari as a free, unpaid ever-willing, ever handy adjunct to her household. She never bestows motherly affection on him. She never feels his absence from the house after his misunderstanding with Mahendra. When she receives the gift sent by Bihari, she remembers him and understands his unselfish and steadfast devotion for her.

The dormant qualities of Rajyalakshmi are revealed at the time of crisis when Mahendra elopes with Binodini. She is shocked with guilt for making Asha's life miserable. Hence she tries her level best so that Mahendra and Asha may be reunited. For the first time, she does not hesitate to abuse Mahendra in the following manner – "Can't you understand what hell she has gone through during these last few days? Shameless boy, your callousness is

breaking my heart."(Ibid: 158) In her changed attitude towards Asha and in her anxiety to bring about reconciliation between Mahendra and Asha, she compels Asha to dress smartly and attend on Mahendra during those rare occasions when he visits his home after his elopement with Binodini.

Her behaviour towards Bihari also changes when Bihari attends her during her illness. At that time, she expresses her true sentiments towards him – "I didn't bear you in my womb and yet no one in this world is more my own than you." (Ibid: 200) Finally, her reconciliation with her sister-in-law Annapurna shows that basically she is not bad. When Annapurna returns to see ailing Rajyalakshmi, she noticed a sea change in her character. Rajyalakshmi welcomes Annapurna warmly and is repentant about her past shabby behaviour towards her. Annapurna feels as if she has rediscovered her lost treasure. Rajyalakshmi is a typical instance of a dowager in a joint family. Through the character of Rajyalakshmi, Tagore points out how mothers like her owing to lack of education, wisdom and being ignorant of the ways of the world, spoil their children by pampering them and thus bring misery to every one around them.

Annapurna

Tagore's novels are full of widows who basically play a small but significant role in the development of the plot. Harimohini of *Gora,* Yogamaya of *Farewell My Friend,* Bara Rani of *The Home and the World* and Damini of *Chaturanga* are some of the famous widows. At the very tender age of her life, Annapurna becomes widow who lives in the house of her sister-in-law, Rajyalakshmi. Being childless she has to suffer too much misery and humiliation. Mahendra is very fond of her and takes solace in her company whenever he quarrels with his mother. When Mahendra marries her niece Asha against the wishes of his mother, Annapurna to some extent, loses her position though she is not in favour of the marriage because she feels that Bihari would be more suitable match for Asha. In this connection, she expresses her feeling to Bihari – "No my son, she can never be Mahin's bride. Believe me when I say that I shall be most satisfied if she is your bride. In fact, I do not approve of her match with Mahin."(Ibid : 11)

Annapurna's position in the house becomes more miserable after Asha's marriage and the situation is further aggravated by Asha who is unable to manage the household responsibilities. That irritates the feeling of her mother-in-law. Annapurna tries to relegate herself to the background in all matter concerning Asha, Mahendra and Rajyalakshmi. She sincerely expresses to her – "She is your daughter-in-law. You may guide her, punish her, as you like, why bring me in." (Ibid: 16) Being afraid to face her son openly Rajyalakshmi expresses his anger to Annapurna. She aptly describes her position in the house when she tells Asha – "Chuni, you've made my life a hell. I can neither stay here in peace nor go elsewhere." (Ibid: 22) Annapurna decides to leave for Kashi to spend the rest of her life on the sacred banks of the river Ganga. She plainly says that she has "no grievance whatsoever against Mahin. Infact, I feel that my going away in necessary for their family peace and happiness." (Ibid 28)

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Before leaving for Kashi she gives her property to Mahendra and a pair of gold bangles to Bihari as a present for his future bride. This incident reveals the noble feature of her character. Inspite of that Annapurna's departure to Kashi , it is essential for the development of the plot. For this reason, the novelist brings Binodini into action after her departure. Annapurna, the great well-wisher of her nice, would not have allowed Binodini to entrap Mahendra. Bimanbehari rightly remarks. "Her (Annapurna's) absence from home afforded Binodini full opportunity to enchant Mahendra." (196: 132) She being Asha's aunt would have done something to avert the calamity that betides her. She also would have prevented Rajyalakshmi from encouraging Binodini to seduce Mahendra. Annapurna is very unfortunate throughout his life and she is aware of that and confesses to Asha that "…rebuff awaited me at every step and finally I came to the desperate conclusion that my whole life had been a waste and a futility." (Ibid: 123) She also realizes that "…our real and ultimate commerce is not with each other but with Him who is the Supreme giver and the supreme taker." (Ibid: 123) Hence she advises Asha to accept stoically all the rebuff from Mahendra.

Conclusion

Unlike Rajyalakshmi, Annapurna's love for Bihari is authentic. It reminds us of the love of Anandamoyi for Benoy in *Gora*. She loves Bihari like her own son. She becomes angry only one when Bihari visits her at Kashi. She gets carried away by Asha's mistaken fear that Bihari has followed her to Kashi with an evil intention and does not welcome him when he calls on her. However, she is quick to make amends when she learns the truth about Bihari's visit. On her return to Calcutta, on the request of Rajyalakshmi and Asha, she visits Bihari and brings him to the house of Mahendra to attend on the ailing Rajyalakshmi. These incidents show the fact that Annapurna is not a woman who stands on false prestige. She accepts bygones as bygones and attends on the ailing Rajyalakshmi to bring solace and comfort to her sister-in-law who has been undergoing great mental turmoil owing to her son's elopement with Binodini. Thus she plays unobtrusively her small part in the final reconciliation of Asha and Mahendra. Above all, Annapurna is a self-effecting, selfless and kind-hearted woman who lives for the service of others.

Thus, Binodini is unique in compare to other female characters in the novel. Except Asha, Binodini, Rajyalakshmi and Annapurna are widows. Through Binodini Tagore for the first time delineates the love of a young widow convincingly and with much sympathy in the history of the Bengali novel. In the words of Niharranjan Ray "She is the symbol of the stricken conscience of the contemporary middle class Hindu society." (1967:186) The other character like Asha, Rajyalakshmi and Annapurna reveal the trials and tribulations which they had to put up

with in the joint family system at that time. The character of Binodani is a tale of New Indian women who wishes to cross the Laxman Rekha with changing time. She proves her ability, potentiality with her behavior, life, beauty and duty that inspires the host of other characters of the succeeding generations of novelist in different languages.

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THE END

ARTICLE

12

MANAGEMENT: THE SCOPE AND FUNCTIONS

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Abstract:

Management is skills / knowledge of combination and co-operation among the various factors of production to achieve goal or objectives of business. There are various meanings are assigned to the word "Management" is sum, management is a science as well as an art of getting things done through others / subordinates. It consists of all activities beginning from business planning to its actual survival. The scope of management can be classified into two aspects subject matter of management and functional areas of management.The functions of management include planning, organising, staffing, directing and controlling. These functions are highly interrelated and when considered as a whole make up the management process.

Introduction

In present time management has become essential in all activities. It has spread in each field of life. Management, unlike other subjects such as economics philosophy, political science is of a recent origin and hence a relatively new subject. It is still in its developing stage. So far as the meaning of management is concerned like other socio-economic terms in the present day's complex business. It has become a difficult and challenging task to strike an effective and harmonious combination and co-operation among the various factors of production.

Inface, this requires a special skill and knowledge how to seek their fullest co-operation to achieve the objectives set by an enterprise. Such skills / knowledge is called management. The need for and important of management to run a small scale enterprise success fully assumes great significance.

Meanings

To manage is to be forecast, to plan; to organise, to command, to co-ordinate and to control. Henery Fiyol, the father of principles of management. "Management is knowing exacitly what you want wents to and then seeking that they do it in the best and cheepest ways – F.W. Taylor Mary Parket Follett views "Management is the art of gelting things done through people".

Peter F. Drucker opines "Management is a multipurpose organ that manages a business, manages manager and manages workers and work". According to George R. Terry "Management is a distinct process consisting of planning organising, actuating and controlling performance to determine and accomplish the objectives by the use of people and resources."

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So, the management is a process of various functions like manning, organising, leading and controlling the business operations in such a manner as to achieve the objectives set by the business firm. It consists of all activities beginning from business planning to it's actual survival.

Scope of Management

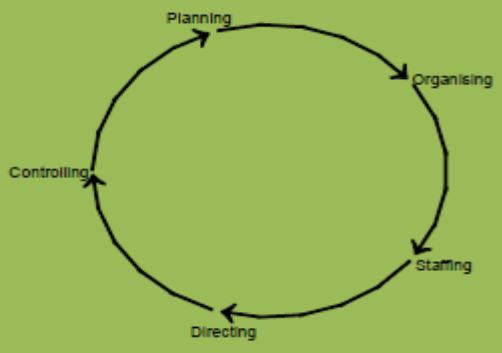
The scope of management can be classified into two aspects.

- Subject matter of Management.
- Functional Area of Management - Financial management, personal management, production management, office management, marketing management and maintenance management.

Functions of Management

"Management is what management does" points out the functional approach to management. No doubt, many management experts have discussed the functions of management in their own ways. How ever, there is no unanimity among their classification of function of management. The different management experts have listed the functions of management on the basis of their experience in an organisation. The nature of activities varies from organisation to organisation. As a matter of fact, list of management functions has been derived based on managerial experience rather than systematic researches. Naturally the observations of one manager may differ from others.

None the less, all the function listed by different management experts are broadly classified into fire main functions. They are –



Functions and process of management

Planning

Every function starts with planning. So is in the business also. In common parlance, planning is a Pre-determind course of action to accomplish the set objectives, say; it is today's projection for tommorrow's activity. Planning gives a business organisation its objectives and sets up the best procedure for reading them. It involves decision making as to what is to be done, how its is to be done, when it is to be done, where is to be done and by whom it is to be done and so on. Thus, planning includes determination of objectives, setting rates and procedures determining projects, selting procedures, policies and strategies, budgeting etc. In practic, planning pervades in all aspects of business. It is very much involved in organising, leading, motivating and controlling, for example.

The importance of planning lies in the fact that it ensures smooth and effective completion of activity whereever it may be organising.

Merely planning is not managing the business. It also includes bringing togather the excutive personnel workers, capital, machinary, materials, physical facilities and other things to excute plans. When these resources are assembled, then the Enterprize comes to life. Thus organising involves bringing togather the manpower and material resources for the achievement set by the enterprize.

Organising

It involves divided work into different parts, grouping these activies in the form of positions, grouping of various positions into departments, assigning such positions in the managers and delegating authority to each manager to accomplish the work in a planned manner. Thus organising function can be viewed as a tool to translate plans into realities. In this way, organising in ultimate analysis provides a mechanism for purposive, integrated and co-operative action by many people in a joint and organished effort to implement a plan.

Staffing

Staffing involves manpower planning and manpower management. In simple words staffin g function includes preparing inventory of personnel available, requirement of personnel, sources of manpower selection, their selection, remuneration, training and development and periodic appraisal of personnel working in the enterprise. Staffing function is performed by every manager of the enterprise of course, personnel department facilities managers in their staffing function by providing. For Example, appraised forms. However, staffing function is a complex and difficult function because it relates to the selection of those persons who are property qualified and mentally rich for business requirement.

Directing

The functions like planning, organising, staffing are merely preparation for doing the work, the directing function actually starts the work. The directing is concerned with guiding, teaching, stimulating and actuating the members to work efficiently. Directing involves telling the employees what and how they have to do. Once the employees are oriented to their Jobs, they need continuous guiding, communicating, motivating and leading.

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According to Joseph Massie – "Directing concerns the total manner in which a manager influences the action of his subordinates. It is the final action of a manager in getting other to act after all preparations have been completed."

Controlling

Controlling is the last function of management. In simple words, controlling means to see whether the activities have been or being performed in conformity with the plans or not. Thus, controlling is comparision of actual results with the targets and objectives, identification of variations between the two, it any, and taking corrective measures so that objectives set are achieved.

Harimann defined "Control is the process of checking to determine whether or not, proper progress is being made towards the objectives and goals and acting if necessary to correct and deviation."

There are som sub-functions involve in controlling.

Determination of objectives or standards, measurement of actual performance, comparision of actual performance with the standards or objectives set, determination of difference between the two and reasons for the same. Taking corrective measures so that the standards or objectives set are attained.

Thus in aggregate there are three main elements in management cycle.

Planning
Execution or implementation.
Control.

Planning action control circle

Sum up

Management is the need in everywhere. Various meanings are assigned to the word "Management". In sum, management is a science as well as art of getting things done through others / subordinates. It consists of all activities beginning business planning to its actual survival.

The scope of management can be classify into two aspects – subject – matter of management and functional areas of management.

The functions of management include planning, organising, staffing, directing and controlling. These functions are highly into-related and when considered as a whole make up the management process.

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ARTICLE

13

INCOME INEQUALITY, EXPENDITURE TAX AND POVERTY RELATION

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Abstract:

Consumption expenditure and poverty are interlinked which reveals to increase consumption expenditure of poor basket of society through government intervention rather than expenditure tax because it is not effective on black or hidden money.

Introduction

Income inequality can't be completely eliminated from India where without labour transfer from agriculture to other sectors of the economy, the contribution of agricultural sector is decreasing over the period. However, this income inequality may be minimized through effective implementation of monetary and fiscal policy together. It can't be minimized through expenditure tax. Therefore, expenditure tax can't be effective instrument minimizing the income inequality or transferring the income from rich to poor.

Income inequality is positively associated with poverty which is the denial of opportunities to lead a long, healthy, creative life to enjoy a decent standard of living, freedom, dignity, self respect of others**(1997,Human Development Report**) . It is deprivation in well being (**2000, World Bank**). This wellbeing is associated with society (**1987, Amartya Sen**).

Objective

To know the expenditure tax reduces the income inequality to be used in minimizing the poverty or not.

Methodology

Sen formula will be used to associate income inequality with poverty.

Analysis

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The **Sen formula** of poverty Index{(P = H.I + (1- I).H.G)} incorporates three factors. First, incidence of poverty (H= q / n) which shows actual number of poor (q) in the population (n). Second, poverty or income gap ration {(I = $\frac{1}{qZ}\ \sum_{i=1}^{q}\ (Z - Ri)$)} which shows income of the poor people falls short of the standard income (Z) . Third, Gini co-efficient {(G = $\frac{2}{q2\ m}\ (\sum_{i=1}^{q}\ (q + 1 - i)\ (m - Ri)$)} which shows inequality with shortage of income (Ri) of the ith individual from average income of the poor (m).

This Sen formula can be modified and be incorporated with the consumption function of the foodgrain by keeping the value of R_i .

P = $\frac{\sum_{i=1}^{q}\ (Z - (\beta CXi + \gamma SXi)\ 2PX]}{q.z}$ **H + [(1-** $\frac{\sum_{i=1}^{q}\ (Z - (\beta CXi + \gamma SXi)\ 2PX]}{q.z}$ **)] H.G**

It reveals following facts.

Poverty increases with rise in the inequality in income distribution. Both the consumption expenditure of poor consumers and the capacity to stock the agricultural products should be increased to decrease the poverty gap ratio. Greater weightage be given to lower income consumers to transfer income from rich to poor.

It said that **Kaldorian expenditure tax** is imposed to curb **Keynesian effective demand** to increase savings. However, in the present study it has been said that consumption expenditures need not be curbed but to be increased in the case of poor consumers. This expenditure tax may be used to curb effective demand of rich consumers. Even in this case, Kaldorian expenditure tax has no control on secret and undeclared wealth (**Robinson and Sraffa Capital theory of growth**). Therefore, **Kaldorian expenditure tax is not an effective tool to transfer income from rich to poor.**

Other strategies, mentioned below, may be used to increase consumption expenditure of the poor. **Percolation strategy** be adopted in which mechanized equipments are used in investment sector not in consumption sector. **Wage good strategy** for applying labour intensive investment may be followed for better income distribution. **Parasitic consumption strategy** be adopted to withdraw consumption beyond subsistence by ultra employed (e.g.service holders). **Real inflation strategy** may be followed to convert employed above subsistence to employ at subsistence through balanced allocation ratio by deficit financing. **Orthodox financing strategy** (tax, minting money, deficit financing, borrowing from public, low interest rate etc.) may applied to transfer resources from rich to poor**. Capital formation strategy** may be used to invest in capacity to store foodgrains. **PURA** (Providing Urban amenities in Rural Areas), as said as by India's former President Dr. Abdul Kalam, may help in removing rural poverty and converting the villages into engines of growth.

Conclusion

Consumption expenditure and poverty are interlinked which reveals to increase consumption expenditure of poor basket of society through government intervention rather than expenditure tax because it is not effective on black or hidden money.

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ARTICLE

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ROLE OF MICROFINANCE IN FINANCIAL INCLUSION IN INDIA

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Abstract:

Rangarajan Committee (Jan. 2008) defines financial inclusion as "process of ensuring access to financial services and timely and adequate credit where needed by vulnerable Groups at an affordable cost."In the third world countries of the world, a large population is still excluded with the financial system and so its advantages. The financial capacity of the individual also determines the intensity of the financial inclusion. The financial inclusion facilitates the mass population to take the advantage of the available financial system. The Self Help Groups (SHGs) are playing very important role in financial inclusion as facilitators. The availability of the credit has been turned easy to the poor ones because of the SHGs involvement in between the financial institutions and the creditors and these credits are taken on shared basis that's why it has comparatively lower risk of default. The cross-country data and evidence from specific policy experiments suggest that more developed financial systems are associated with lower inequality and lower financial exclusion (Rakesh Mohan, November 2006, World Bank 2007). The impact through the mechanism of financial markets may be more sustainable than the grants and subsidies. Hence, if financial market frictions are not addressed, redistribution approach for equality may have to be endlessly repeated, which could result in damaging incentives to work and save (World Bank, op cit). The financial development and improved access to banking & related services not only accelerate economic growth but also reduce income inequality and poverty (HM Treasury 2007 and Sangwan, 2007). Without inclusive financial systems, the financially excluded individuals and enterprises with promising opportunities are limited to their own savings and earning.

Introduction

Microfinance Defined.

Microfinance is usually understood to entail the provision of financial services to micro-entrepreneurs and small businesses, which lack access to banking and related services due to the high transaction costs associated with serving these client categories. The two main mechanisms for the delivery of financial services to such clients are (1) relationship-based banking for individual entrepreneurs and small businesses; and (2) group-based models, where several entrepreneurs come together to apply for loans and other services as a group.

Microfinance sector has traversed a long journey from micro savings to micro credit and then to micro enterprises and now entered the field of micro insurance, micro remittance and micro pension. This gradual and evolutionary growth process has given a great opportunity to the rural poor in India to attain reasonable economic, social and cultural empowerment, leading to better living standard and quality of life for participating households. Financial institutions in the country continued to play a leading role in the microfinance programme for nearly two decades now. They have joined hands proactively with informal delivery channels to give microfinance sector the necessary momentum. During the current year too, microfinance has registered an impressive expansion at the grass root level.

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Financial Inclusion

Financial inclusion broadly means the provision of affordable financial services, viz., access to payments and remittance facilities, savings, loans and insurance services by the formal financial system to those who tend to be excluded. Since late nineties, the sophisticated and competitive financial services enable access to a wide range of financial products and opportunities to meet emerging credit needs.

The overall objective of these measures is to increase the people's ability to manage their money. However, financial inclusion is not only limited to opening of bank accounts but also the banking education to make use of banking facilities and products to better manage their money and capabilities.

The main reason for financial exclusion is the lack of a regular or substantial income. In most of the cases people with low income do not qualify for a loan. The proximity of the financial service is another fact. The loss is not only the transportation cost but also the loss of daily wages for a low income individual. Most of the excluded consumers are not aware of the bank's products, which are beneficial for them. Getting money for their financial requirements from a local money lender is easier than getting a loan from the bank. Most of the banks need collateral for their loans. It is very difficult for a low income individual to find collateral for a bank loan. Moreover, banks give more importance to meeting their financial targets. So they focus on larger accounts. It is not profitable for banks to provide small loans and make a profit.

Financial inclusion mainly focuses on the poor who do not have formal financial institutional support and getting them out of the clutches of local money lenders. As a first step towards this, some of our banks have now come forward with general purpose credit cards and artisan credit cards which offer collateral-free small loans. The RBI has simplified the KYC (Know your customer) norms for opening a 'No frill' account. This will help the low income individual to open a 'No Frill' account without identity proof and address proof.

Self Help Groups are playing a very important role in the process of financial inclusion. SHGs are usually groups of women who get together and pool money from their savings and lend money among them. Usually they are working with the support of an NGO. The SHG is given loans against the group members' guarantee. Peer pressure within the group helps in improving recoveries. Through SHGs nearly 40 million households are linking with the banks. Micro finance is another tool which links low income groups to the banks.

Yet, banks are fighting to fulfill the Financial Inclusion dream. The main reason is that the products designed by the banks are not satisfying the low income families. The provision of uncomplicated, small, affordable products will help

to bring the low income families into the formal financial sector. Banks have limitations to reach directly to the low income consumers. Correspondents can be considered to be an excellent channel which banks can use to distribute their product information. Educating the consumers about the financial benefits and products of banks which are beneficial to low income groups will be a great step to tap their potential.

Factors Affecting Financial Inclusion

A number of factors affecting access to financial services have been identified in many countries. Major factors are written below.

• ***Gender issues:***

Access to credit is often limited for women who do not have, or cannot hold title to assets such as land and property or must seek male guarantees to borrow.

• ***Age factor:***

Financial service providers usually target the middle of the economically active population, often overlooking the design of appropriate products for older or younger potential customers.

• ***Legal identity:***

Lack of legal identities like identity cards, birth certificates or written records often exclude women, ethnic minorities, economic and political refugees and migrant workers from accessing financial services.

• ***Limited literacy:***

Limited literacy, particularly financial literacy, *i.e*., basic mathematics, business finance skills as well as lack of understanding often constrain demand for financial services.

• ***Place of living:***

Although effective distance is as much about transportation infrastructure as physical distance, factors like density of population, rural and remote areas, mobility of the population (*i.e.,* highly mobile people with no fixed or formal address), insurgency in a location, *etc.,* also affect access to financial services.

• ***Psychological and cultural barriers:***

The feeling that banks are not interested to look into their cause has led to self-exclusion for many of the low income groups. However, cultural and religious barriers to banking have also been observed in some of the countries.

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• ***Social security payments:***

In those countries where the social security payment system is not linked to the banking system, banking exclusion has been higher.

• ***Bank charges:***

In most of the countries, transaction is free as long as the account has sufficient funds to cover the cost of transactions made. However, there are a range of other charges that have a disproportionate effect on people with low income.

• ***Terms and conditions:***

Terms and conditions attached to products such as minimum balance requirements and conditions relating to the use of accounts often dissuade people from using such products/services.

• ***Level of income:***

Financial status of people is always important in gaining access to financial services. Extremely poor people find it difficult to access financial services even when the services are tailored for them. Perception barriers and income discrimination among potential members in group-lending programmes may exclude the poorer members of the community.

• ***Type of occupation:***

Many banks have not developed the capacity to evaluate loan applications of small borrowers and unorganised enterprises and hence tend to deny such loan requests.

• ***Attractiveness of the product:***

Both the financial services/products (savings accounts, credit products, payment services and insurance) and how their availability is marketed are crucial in financial inclusion.

Contribution of Microfinance in empowering Self Help Groups (SHGs) and Financial Inclusion.

Self-Help Groups – Bank Linkage Programme

An SHG is a group of about 15 to 20 people from a homogenous class who join together to address common issues. They involve voluntary thrift activities on a regular basis, and use of the pooled resource to make interest-bearing loans to the members of the group. In the course of this process, they imbibe the essentials of financial

intermediation and also the basics of account keeping. The members also learn to handle resources of size, much beyond their individual capacities. They begin to appreciate the fact that the resources are limited and have a cost. Once the group is stabilised, and shows mature financial behaviour, which generally takes up to six months, it is considered for linking to banks. Banks are encouraged to provide loans to SHGs in certain multiples of the accumulated savings of the SHGs. Loans are given without any collateral and at interest rates as decided by banks. Banks find it comfortable to lend money to the groups as the members have already achieved some financial discipline through their thrift and internal lending activities. The groups decide the terms and conditions of loan to their own members. The peer pressure in the group ensures timely repayment and becomes social collateral for the bank loans.

Generally, the SHGs need self-help promoting institutions (SHPIs) to promote and nurture them. These SHPIs include various NGOs, banks, farmers' clubs, government agencies, self-employed individuals and federations of SHGs. However, some SHGs have also been formed without any assistance from such SHPIs.

There are three different models that have emerged under the linkage programme:

• Model I: This involves lending by banks directly to SHGs without intervention/facilitation by any NGO.

• Model II: This envisages lending by banks directly to SHGs with facilitation by NGOs and other agencies.

• Model III: This involves lending, with an NGO acting as a facilitator and financing agency.

Some Highlight of SHG Bank Linkage Programs

Physical

- Total number of SHGs savings linked with banks : 69.53 lakh
- Out of total [of which] exclusive Women SHGs : 53.10 lakh
- Out of total [of which] – SGSY SHGs : 16.94 lakh
- Total number of SHGs credit linked during 2009-10 : 15.87 lakh
- Out of total [of which] exclusive Women SHGs credit linked : 12.94 lakh
- Out of total [of which]-SGSY SHGs credit linked : 2.67 lakh
- Total number of SHGs having loans outstanding as on 31 March 2010 : 48.51 lakh
- Of which exclusive Women SHGs : 38.98 lakh
- Of which-SGSY SHGs : 12.45 lakh
- Estimated number of of families covered upto 31 March 2010 : 97 million

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Financial

- Total savings amount of SHGs with banks as on 31 March 2010 : Rs 6198.71 crore
- Out of total savings of exclusive Women SHGs : Rs 4498.66 crore
- Out of total savings of SGSY SHGs : Rs 1292.62 crore
- Total amount of loans disbursed to SHGs during 2009-10 : Rs 14453.30 crore
- Out of total loans disbursed to Women SHGs : Rs 12429.37 crore
- Out of total loans disbursed to SGSY SHGs : Rs 2198.00 crore
- Total amount of loans outstanding against SHGs as on 31 March 2010 : Rs 28038.28 crore
- Out of total loans o/s against Women SHGs : Rs 23030.36 crore
- Out of total loans o/s against SGSY SHGs : Rs 6251.08 crore
- Average loan amount outstanding per SHG as on March 2010 : Rs 57795
- Average loan amount outstanding per member as on 31 March 2010 : Rs 4128

The Status of Self Help Groups (SHGs) in India

The average loan outstanding per SHG has increased from Rs.57,795/- in March 2010 to Rs.65,224 in March 2011. Peer pressure plays an important role in SHG mechanism which ensures timely recovery of outstanding loan. As on 31.03.2011 over 95% SHG loan accounts are regular.

The Self Help Group (SHG)-Bank Linkage Programme, in the past eighteen years, has become a well known tool for bankers, developmental agencies and even for corporate houses. SHGs, in many ways, have gone beyond the means of delivering the financial services as a channel and turned out to be focal point for purveying various services to the poor. The programme, over a period, has become the common vehicle in the development process, converging important development programmes. With the small beginning as Pilot Programme launched by NABARD by linking 255 SHGs with banks in 1992, the programme has reached to linking of 69.5 lakh saving-linked SHGs and 48.5 lakh credit-linked SHGs and thus about 9.7 crore households are covered under the programme, envisaging synthesis of formal financial system and informal sector.

Conclusion

Self Help Groups with the help of micro finance institutions and banks have contributed so much to facilitate the financial inclusion to the public at large. The SHGs are playing very important role towards empowering the women and specially the poor class. The SHGs offers the synergy effect and keep the team members motivate to move forward positively. The microfinance institutions is smoothening the availability of the loans to under-privileged section of the society and making them financially self dependent and creating new opportunities to earn and grow. The availability of finance is the major hurdle to start a business and a major catalyst to do the same. When the finance availability issue is with a poor, no institution is positive enough to provide a risky credit because of risk perception involved. SHGs back up to group members for financial facilitation as well as provides support and motivation too.

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ARTICLE

15

A Fresh Look At The Indo-Central Asian Relation, Past, Present And Future

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Abstract:

After the fall of Soviet Union a series of events took play for example crumbling of berlin wall and unification of Germany. Again there was violent break of Yugoslovian on the basis of ethnic nationalism. Right from the breakup of Soviet Union so many countries has come up with a free market economy, from a single party authorization rule to a democratic pluralism.

Introduction

A new trend in then to watch in international arena- Politically the nations are breaking up Example Poland, Hungry, Bulgaria, Romania, Czech Slovak and fifteen other republic which were part of earst while Soviet union. But on economic side we see the globalization of world economy and this has helped in the inter dependence of nations and formation of different regional grouping like ASEAN, APEC, EU, NAFTA etc.

India and Central Asian countries-

The five central Asian republic of Kazakhstan, Kirgizstan Uzbekistan, Tajikistan, and Turkmenistan are all going through a period of transition and ferment.

Although they formed a separate identity for their nation after the breaking away from Soviet Union their power structure is still dominated by personalities of of previous communist regime. Although Press, Political Parties, Democratic institutions are allowed to function but still it is in infancy stage, it will take long time to grow to adulthood.

After the withdrawal of Soviet influence and centralized governance of Soviet Union, these countries are falling shortage of trained, man power and they are also facing the problem in implementing their new political and economic agenda based on decentralisation. This has created a vacuum.

This has also two created a dichotomy between industrially and economically advanced countries of Europe and Asia and Russia. Advanced countries of Asia and Europe consider these republic to be an attractive economic proposition and Russia too want to make profit out of it. Thus there is Clash of interest.

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Again although there seem to be a great unity amongst their nation due to Islam, and Twinkle ethnic identity covering all these nation but underneath this unity, there is a great storm of dissent blowing. Example there is great diversity of language, culture and socio cultural behavior. Again all these republics are facing the problem of national identity because they all were part of Soviet Union.

Islam could have been a unifying factor but it is perceived as dangerous b/c an Islamic identity may erode the territorial integrity. If Islam becomes important aspect in their national life then they may lose modernity which they acquired while they were part of Soviet Union.

Again there is a general desire of all these countries to distance themselves from Russia but practically they will have to accept it due to geographical and other reasons. Uzbekistan, Kazakhstan wants to involve U.S.A. for their development. Again it wants to develop relation with Sunni Muslim countries such as Pakistan, Saudi Arab. Again Kyrgyzstan being small country, is having historical memory of being created by Stalin, is worried about its existence due to over whelming presence of Turkmenistan are subject to pressure.

These complexities of regional polities have resulted in adaptation of following policy.

a. They all are allying with NATO.
b. They put great stress on territorial rights.
c. They support N.P.T., C.T.B.T.
d. They want economic tie with U.S.A.

Again a western county M.N.C. is eyeing this area due to large scale petroleum, gas in this region.

Again there is a role of religion also, for Example Pakistan, Saudi Arab are trying to put foot in this region on the basis of religions sentiments and solidarity based on religion.

Pakistan wants to have intra Asian relationship excluding India, Russia and Chiana. Due to this reason Pakistan is Investing a great deal in health, education etc. in this region. Thus Pakistan is playing the card of Pan Islamism. Again except Kyrgyzstan all the four republic of central Asia has supported Pakistan issue.

Role of India– Although Pakistan is playing the Islamic card and far in the people of their countries are concerned they feel altercated to Islamic connection but at the same time their interaction and friendship with India while they were part of Russia has left a positive mark. They had a long cultural, linguistic and literacy connection with India.

But we Indians must nurture this with responsive action otherwise Islamic advocacies of Pakistan can submerge this undercurrent of good will and friendship.

Although in 1992 Narsimha Rao tried to develop good relation with these republics and revisited four republics out of five. Again India gave credit to their countries. Again we signed agreement with Iran and Russia for transit facility for commercial and cultural exchanges. Again we signed a series of Bi-lateral treaties etc. we have got cultural centre in Uzbekistan and Kazakistan.

Our M.N.C. is trying to gain foot in there countries but these macro level Initiative in not significant. Compared to Pakistan, Japan, Korea and Iran we are far lagging behind. This casts an impression that India is not interested in central Asian republic. Indian M.N.C. instead of seeing short term gain must see the long term perspective. They must be Futuristic in their look and they must have infra- structural partnership with these republic.

Boon in disguise- But the leader of all there republic want to have democratic government and they all hate centralized role of while they were part of Soviet Union.

They don't want to be satellite of any nation or ideology. These they fear if Orthodoxy prevails in their society due to Islam then they will lose freedom liberty and democratic norms which they got after a long fight. Again they don't want to be puppet in the hand of China, Russia and U.S.A. and thus they want to have relation with India so that it can act as a balancer. India can balance the orthodoxy as well as March of Pakistan, Russia and U.S.A. again there is a great market for Indian goods in these countries.

Although a beging has already begun. Example O.N.G.C. has opened its branch at "Almaty" again Lakshmi Mittal has taken the largest iron and steel plant at Kazakhstan.

But this is a beginning. We must have cultural, social, as well as educational links with these countries. We must t consider them to be our neighbor and we must not seek any short term frame. As against this we must have long term strategy regarding central Asian republic.

While the foreign policy of India towards central Asian republic has limitation of resources available to it both human and mental but it has to be mode strong, dynamic and resilient, so that it caters to political cultural and economic head of India. Although it will take time but it is not difficult. Till now we have not given due attention to this region and we must take responsibility for this failure.

Thus the need of hour is futuristic and committed foreign policy towards central Asian republic.

We must smack of old mindset and knee jerk attitude in our foreign policy. We must look to our salves with confidence, then only we can achive the objective. We must become a global player instead of regional and for that we have to do a internal response mobilization and getting internal progress of country instead of torn and strife. By being internally strong we will have tooth in our foreign policy.

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The international system is much more then the interstate system. We realist always take map notion of state. State is not just the map. There are inter state actor, society economy and other factor which comprises state. Thus international relations is about the Internationalization of domestic politics and domestication of International politics. Thus while formulating our foreign policy towards central Asian republic we must keep in view the social change, social movement, role of individual, G.D.P. of India as well as central Asian republic then only, we will have a good cordial and viable relationship. At Regional level Previously also political Islam was used during the heyday of ideological conflict between two block as a tools to fight narserism in Egypt and Baath party in iraq. Saudi Arab O.I.C. and U.S. used it to fight against atheism of U.S.S.R. and they gave and organizational base to it. Now Saudi Arab and Iran is engased in cold war for leadership of Islamic World.

Thus is this scenario India could gain a strong hold in central Asia if it follows its policy wisely.

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ARTICLE

16

INTEGRAL INVOLVING THE PRODUCT OF I-FUNCTION OF MULTI-VARIABLE

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Abstract:

In the present paper, we have been introduction I-function of multivariables (1.1) and its particular cases. Using MacRobert (6) integral with developed I-function of Multivariables.

Introduction

The I- function of one variable was recently introduced by Sexena V.P. (1) is an extension of Fox's H-function. This I-function includes Meijer's G-function, MacRoberts E-function. Lauricella function, Appell functions F_1, F_2, F_3 and F_4. Whittakar function etc. as particular cases. We will represent the I-function of Multivariables here in the following manner.

$$I^{0,n\quad :(m_1,n_1);\ldots;(m_r,n_r)}_{P_i,q_i:R:[P_{i'},q;:R'];\ldots;[P_i^{(r)},\,q_i^{(r)}:\,R^{(r)}]}$$

$$\left[\begin{matrix} z_1 \\ \vdots \\ z_r \end{matrix}\middle|\begin{matrix}[(a_j;\alpha_j'\ldots\alpha_j^{(r)})_{1,n}]\quad[(a_{ji};\alpha_{ji}'\ldots\alpha_{ji}^{(r)})_{n+1,p_i}] \\ (b_j,;\beta_{ji}'\ldots\beta_{ji}^{(r)})_{1,q_i}]\end{matrix}\right.$$

$$\left.\begin{matrix};\ldots;\ [(c_j^{(r)},\gamma_j^{(r)})_{1,n_r}]\,[(c_{ji_{(r)}}^{(r)},\gamma_{ji_{(r)}}^{(r)})_{n_r+1,p_i^{(r)}}] \\ ;\ldots;\ [(d_j^{(r)},\delta_j^{(r)})_{1,m_r}]\,[(d_{ji_{(r)}}^{(r)},\delta_{ji_{(r)}}^{(r)})_{m_r+1,q_i^{(r)}}]\end{matrix}\right] dz$$

$$=\frac{1}{(2\pi\omega)^r}\int_{L_1}\ldots\int_{L_r}\phi_1(\xi_1)\ldots\phi_{(r)}(\xi_r)\Psi(\xi_1,\ldots\xi_r)z_1^{\xi_1}\ldots z_r^{\xi_r}d\xi_1\ldots d\xi_r \qquad (1.1)$$

where, $\omega=\sqrt{(-1)}$

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$$\phi_k(\xi_k)=\frac{\prod_{j=1}^{m_k}\Gamma(d_j^{(k)}-\delta_j^{(k)}\xi_k)\prod_{j=1}^{n_k}\Gamma(1-c_j^{(k)}+\gamma_j^{(k)}\xi_k)}{\sum_{i^{(k)}=1}^{R^{(k)}}\left[\prod_{j=m_k+1}^{R^{(k)}}\Gamma(1-d_{ji}^{(k)}+\delta_{ji}^{(k)}\xi_k)\prod_{j=n_k+1}^{P_i^{(k)}}\Gamma(c_{ji}^{(k)}-\gamma_{ji}^{(k)}\xi_k)\right]}$$

$$\forall\ k\in\{1\ldots r)$$

$$\psi(\xi_1\ldots\xi_r)=\frac{\prod_{j=1}^{n}\Gamma\left(1-a_j+\sum_{k=1}^{r}\alpha_j^{(k)}\xi_k\right)}{\sum_{i=1}^{R}\left[\prod_{j=n+1}^{P_i}\Gamma\left(a_{ji}-\sum_{k=1}^{r}\alpha_{ji}^{(k)}\xi_k\right)\prod_{j=1}^{q_i}\left(1-b_{ji}+\sum_{k=1}^{r}\beta_{ji}^{(k)}\xi_k\right)\right]}$$

In (1.1), k in the superscript (k) stands for the number of primes; and $z_1\ldots z_r$ are not equal to zero and an empty product is interpreted as unity.

Suppose as usual, that the parameters,

$a_j, j=1\ldots n;\ a_{ji}, j=n+1,\ldots P_i;\ b_{ji}, j=1\ldots q_i;\ c_j^{(k)}, j=1\ldots n_k;\ c_{ji^{(k)}}^{(k)}, j=n_k+1,\ldots p_{i^{(k)}};$

$d_j^{(k)}, j=1\ldots m_k+1;\ d_{ji^{(k)}}^{(k)},\ j=m_k+1,\ldots q_{i^{(k)}};\ \forall i\in\{1\ldots R\},\quad \forall\ i^{(k)}\in\{1\ldots R^{(k)}\};\ \forall\ k\in\{1\ldots r\},$ are complex numbers, and all the α's, β]s, γ's and δ's are assumed to be positive real numbers.

The contour L_k in the complex ξ_k - plane is of the mellin-Barnes type which runs from $-w\infty$ to $+w\infty$ with indentations, if necessary to ensure that all the poles of $\Gamma(d_j^{(k)}-\delta_j^{(k)}\xi_k)$, j=1…$m_k$ are separated from those of

$\Gamma\left(1-c_j^{(k)}+\gamma_j^{(k)}\xi_k\right)$ j=1..m_k and $\Gamma\left(1-a_j^{(k)}+\sum_{k=1}^{r}a_j^{(k)}\xi_k\right)$

$$j=1....n;\ \forall\ k\in[1...r]$$

Hence,

$$U_k=\sum_{j=1}^{n}\alpha_j^{(k)}+\sum_{j=n+1}^{P_i}\alpha_{ji}^{(k)}+\sum_{j=1}^{n_k}\gamma_j^{(k)}+\sum_{j=n_k+1}^{P_i(k)}\gamma_{ji^{(k)}}^{(k)}-\sum_{j=1}^{q_i}\beta_{ji}^{(k)}-\sum_{j=1}^{m_k}\delta_j^{(k)}-\sum_{j=m_k+1}^{q_{i(k)}}\delta_{ji^{(k)}}^{(k)}\le 0,$$

And

$$Vv_k=\sum_{j=1}^{n}\alpha_j^{(k)}-\sum_{j=n+1}^{P_i}\alpha_{ji}^{(k)}+\sum_{j=1}^{n_k}\gamma_j^{(k)}+\sum_{j=n_k+1}^{P_i(k)}\gamma_{ji(k)}^{(k)}-\sum_{j=1}^{q_i}\beta_{ji}^{(k)}+\sum_{j=1}^{m_k}\delta_j^{(k)}-\sum_{j=m_k+1}^{q_{i(k)}}\delta_{ji(k)}^{(k)}>0,\ \forall k\in\{1...r\}$$

$$\forall i^{(k)}\in\{1...R^{(k)}\};\ \forall k\in\{1...r),\ p_iq_i,\ p_{i^{(k)}}\ q_{i^{(k)}},\ n,n_{i^{(k)}}$$

And

$m_i(k),\ \forall i\in\{1...R\},\ \forall i^{(k)}\in\{1...R^{(k)}\}\ \forall k\in\{1...r\}$ are non-negative in tigers such that

$$P_i\ge n\ge 0,\ P_{i^{(k)}}\ge n_{i^{(k)}}\ge 0, q_i\ge 0,\ q_{i^{(k)}}\ge 0\ \forall i\in\{1...R),\ \forall i^{(k)}\in\{1...R^{(k)}\}\ and\ \forall k\in\{1...r\}$$

Asympiotic Expansion:

We may establish the asymptotic expansion in the following convenient form:

$$I[z_1..z_r]=\begin{cases}0(|z_1|^{\alpha_1}...|z_r|^{\alpha_r}),\max|z_1|,...|z_r|\to 0\\ 0(|z_1|^{\beta_1}...|z_r|^{\beta_r}),\ n=0,\ \min\{|z_1|...|z_r|\to 0\end{cases}$$

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where, with, k=1…r

$$\begin{cases}\alpha_k=\min\{\mathrm{Re}(d_j^{(k)}/\delta_j^{(k)})\},\ j=1...m_k\\ \beta_k=\max\{\mathrm{Re}(c_j^{(k)}-1)/\gamma_j^{(k)}\},\ j=1....n_k\end{cases}$$

Special Cases of I-Function of Multi-Ariable:

In this section, we mention some interesting and useful special cases of the I-function of multi-variables. These results immediately follow by comparing the definition of the I-function of multi-variables with those of other special, functions.

(1) If r=1 in (1.1), we get H-function of multivariables.

(2) If $n=p_i=q_i=0$ in (1.1), the I-function of multivariables breaks up into a product of multi I-function of one variables.

(3) If r=1, $n=p_i=q_i=0$ in (1.1) the I-function of multivariables breaks up into a product of multi Fox's H-function of one variable.

(4) If r=1 and all E, s=α, $s=\beta$, $s=\delta$, $s=\gamma$, $s=1$ in (1.1), then I-function of multivariables reduces into G-function of multivariables.

$$I^{0,n\ :(m_1,n_1);...;(m_r,n_r)}_{P_i,q_i:R:[P_i',q_i';:R'];...;[P_i^{(r)},\ q_i^{(r)}:R^{(r)}]}$$

$$\left[\begin{matrix}z_1\\ \vdots\\ z_r\end{matrix}\middle|\begin{matrix}[(a_j;\alpha_j'...\alpha_j^{(r)})_{1,n}]\quad[a_{ji};\alpha_{ji}'...\alpha_j^{(r)})_{n+1,p_i}];\\ (b_j,;\beta_{ji}'...\beta_{ji}^{(r)})_{1,q_i}]\end{matrix}\right.$$

$$[(c_j',\gamma_j')_{1,n_1}][(c_{ji}',\gamma_{ji}')_{n_1+1,P_i}];\ .....$$

$$[(d_j',\delta_j')_{1,m_1}][(d_{ji}',\delta_{ji}')_{m_1+1,q_i}];.....$$

$$[(c_j^{(r)},\gamma_j^{(r)})_{1,n_r}][(c_{ji}^{(r)},\gamma_{ji}')_{n_r+1,p_{i(r)}}]$$
$$[(d_j^{(r)},\delta_j^{(r)})_{1,m_r}][(d_{ji}^{(r)},\delta_{ji}^{(r)})_{m_r+1,q_{i(r)}}]$$
$$=G^{0,n\quad :(m_1,n_1);\ldots(m_r,n_r)}_{P_i,q_i:R:[P_{i'},q;':R'];\ldots[P_i^{(r)},\,q_i^{(r)}:R^{(r)}]}$$
$$\left[\begin{matrix}z_1\\ \vdots\\ z_r\end{matrix}\middle|\begin{matrix}[(a_j,1)_{1,n}];\\ [(b_{ji},1)_{1,m}];\end{matrix}\right.$$

$$\left.\begin{matrix}[(c_j',1)_{1,n_1}][(c_{ji}',\gamma_{ji}'{}_{n_1+1,P_i}];\ldots\ldots\ldots[(c_j^{(r)},\gamma_j^{(r)})_{1,n_r}][(c_{ji}^{(r)},\gamma_{ji}'{}_{n_r+1,p_i}]\\ [(d_j',1)_{1,m_1}][(d_{ji}',\delta_{ji}')_{m_r+1,q_i}];\ldots\ldots\ldots[(d_j^{(r)},\delta_j^{(r)})_{1,m_r}][(d_{ji}^{(r)},\delta_{ji}^{(r)})_{m_r+1,q_i}]\end{matrix}\right]$$

Required results:

We shall require the following definition

$$(\alpha)_n=\frac{\Gamma(\alpha+n)}{\Gamma(\alpha)}=\alpha(\alpha+1)(\alpha+2).....(\alpha+n-1)$$
$$=\prod_{k=1}^{n}(\alpha+k-1),\ n\geq 1$$

$(a)_0=1,\ a\neq 0$ and MacRobert (6) result

$$\int x^{\lambda-1}(1-x)^{\gamma-1}[(1+cx+d(1-x)]^{-\lambda-\gamma}\,{}_2F_1\left[\begin{matrix}\alpha+\beta;\\ \gamma;\end{matrix}\frac{(1-x)(1+d)}{1+cx+d(1-x)}\right]dx$$
$$=\frac{(1+c)^{-\lambda}(1+d)^{-\gamma}\Gamma(\lambda)\Gamma(\gamma)\Gamma(\lambda+\gamma-\alpha-\beta)}{\Gamma(\lambda+\gamma-\alpha)\Gamma(\lambda+\gamma-\beta)}$$

Re $(\lambda)>0,\ \ \mathrm{Re}(\gamma)>0,\ \ \mathrm{Re}(\gamma-\alpha-\beta)>0$

MAIN INTEGRAL:

$$\int_0^1 x^{\lambda-1}(1-x)^{\gamma-1}[(1+cx+d(1-x)]^{-\lambda-\gamma}\,{}_2F_1\left[\begin{matrix}\alpha,\beta;\\ \gamma;\end{matrix}\frac{(1-x)(1+d)}{1+cx+d(1-x)}\right]$$

$$I^{0,n\quad :(m_1,n_1);\ldots(m_r,n_r)}_{P_i,q_i:R:[P_{i'},q;':R'];\ldots[P_i^{(r)},\,q_i^{(r)}:R^{(r)}]}$$

$$\left[\begin{matrix}z_1\left[\frac{x}{1+cx+D(1-x)}\right]^k\\ \vdots\\ z_r\end{matrix}\middle|\begin{matrix}[(a_j,\alpha_j'\ldots\alpha_j^{(r)})_{1,n};][(a_{ji};\alpha_{ji}'\ldots\alpha_{ji(r)}')_{n+1,p_i}];[(c_j',\gamma_j')_{1,n}],\\ (b_{ji},\beta_{ji}'\ldots\beta_{ji}^{(r)})_{1,q_i}]:\qquad\qquad;[(d_j',\delta_j')_{1,m_1}],\end{matrix}\right.$$
$$\left.\begin{matrix}[(c_{ji}',\gamma_{ji}')_{n_1+1,P_i}];\ldots;[(c_j^{(r)},\gamma_j^{(r)})_{1,n_r}][(c_{ji(r)}^{(r)},\gamma_{ji(r)}^{(r)})_{n_r+1,p_{i(r)}}]\\ [(d_{ji}',\delta_{ji}')_{m_1+1,q_i}];\ldots;[(d_j^{(r)},\delta_j^{(r)})_{1,m_r}][(d_{ji(r)}^{(r)},\delta_{ji(r)}^{(r)})_{m_r+1,q_{i(r)}}]\end{matrix}\right]dz$$
$$=(1+c)^{-\lambda}(1+d)^{-\gamma}\Gamma(\gamma)\ I^{0,n\quad :(m_1,n_1);\ldots(m_r,n_r)}_{P_i,q_i:R:[P_{i'},q;':R'];\ldots[P_i^{(r)},\,q_i^{(r)}:R^{(r)}]}$$

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$$\left[\begin{matrix} z_1(1+c)^{-k} \\ \vdots \\ z_r \end{matrix}\middle|\begin{matrix}[(a_j;\alpha_j'...\alpha_j^{(r)})_{1,n}][(a_{ji};\alpha_{ji}';\alpha_{ji}'...\alpha_{ji^{(r)}}')_{n+1,P_i}],(1-\lambda,k) \\ [(b_{ji},\beta_{ji}'...\beta_{ji}^{(r)})_{1,q_i}] \qquad (1+\alpha-\lambda-\gamma,k)\end{matrix}\right.$$

$$\left.\begin{matrix}(1+\alpha+\beta-\lambda-\gamma,k)[(c_j',\gamma_j')_{1,n_1}][(c_{ji}',\gamma_{ji}')_{n_1+1,p_i}];...;[(c_j^{(r)},\gamma_j^{(r)})_{1,n_r}][(c_{ji_{(r)}}^{(r)},\gamma_{ji_{(r)}}^{(r)})_{n_r+1,\,p_{i^{(r)}}}] \\ (1+\beta-\lambda-\gamma,k)\,[(d_j',\delta_j')_{1,m_1}][(d_{ji}',\delta_{ji}')_{m_1+1,q_i}];...;[(d_j^{(r)},\delta_j^{(r)})_{1,m_r}][(d_{ji_{(r)}}^{(r)},\delta_{ji_{(r)}}^{(r)})_{m_r+1,qi^{(r)}}]\end{matrix}\right]$$

(3.1)

Re $(\gamma)>0$, $\mathrm{Re}(\lambda+\gamma-\alpha-\beta)>0$

where c and d are constants, such that non of expression are
(1+c) (1+d), (1+cx+d) (1-x)]>0, $\forall 0\le x\le 1$

Proof :- To establish the integral (3.1), here we first use the definition of I-function of multivariables (1.1), then the help of MacRobert (6) result (2.2) we have

$$=\frac{1}{(2\pi i)^r}\int_{L_1....}\int_{L_r}\phi_1(\xi_1)...\phi_r(\xi_r),\psi(\xi_1..\xi_r)\,z_1...z_r\left[\int_0^1 x^{\lambda+k\,\xi_1}(1-x)^{\gamma-1}\right.$$

$$\left.[1+cx+d(1-x)^{-\lambda-k\xi_1-\gamma}\,{}_2F_1\left[\begin{matrix}\alpha; \\ \gamma;\end{matrix}\frac{(1-x)(1+d)}{1+cx+d\,(1-x)}\right]d\xi_1....d\xi_r\right.$$

$$=\frac{1}{(2\pi w)^r}\int_{L_1....}\int_{L_r}\phi_1(\xi_1)...\phi_r(\xi_r),\psi(\xi_1..\xi_r)\,z_1^{\xi_1}..z_r^{\xi_r}$$

$$\left[\frac{(1+c)^{-\lambda-k\xi_1}(1+d)^{-\gamma}\Gamma(\lambda+k\xi_1)\Gamma(\gamma)\Gamma(\lambda+\gamma+k\xi_1-\alpha-\beta)}{\Gamma(\lambda+\gamma+k\xi_1-\alpha)\;\Gamma(\lambda+\gamma-k\xi_1-\beta)}\right]d\xi_1...d\xi_r$$

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which is the required integral (3.1)

Speacial Cases:

1. If we take R=1 in (3.1), we get an integral involving H-function of multivariable.

$$\int_0^1 x^{\lambda-1}(1-x)^{\gamma-1}[(1+cx+d(1-x)]^{-\lambda-\gamma}\,{}_2F_1\left[\begin{matrix}\alpha,\beta; \\ \gamma\end{matrix}\frac{(1-x)(1+d)}{;1+cx+d\,(1-x)}\right]$$

$$H^{0,n\quad :(m_1,n_1);...;(m_r,n_r)}_{P_i,q_i:R:[P_i',q_i';R'];...;[P_i^{(r)},\,q_i^{(r)};\,R^{(r)}]}$$

$$\left[\begin{matrix} z_1\left[\frac{x}{1+cx+D(1-x)}\right]^k \\ \vdots \\ z_r \end{matrix}\middle|\begin{matrix}[(a_j,\alpha_j'...\alpha_j^{(r)})_{1,n}]:(c_j';\gamma_j')_{1,P_1};....;(c_j^{(r)};\gamma_j^{(r)})_{1,P_r} \\ (b_{ji},\beta_{ji}'...\beta_{ji}^{(r)})_{1,q_i}]:(d_j';\delta_j')_{1,q_1};....;(d_j^{(r)};\delta_j^{(r)})_{1,q_r}\end{matrix}\right]dx$$

$$=(1+c)^{-\lambda}(1+d)^{-\gamma}\,\Gamma(\gamma)\;H^{0,n\quad :(m_1,n_1+2);...;(m_r,n_r)}_{P_i,q_i:R:[P_i',q_i';R'];...;[P_i^{(r)},\,q_i^{(r)};\,R^{(r)}]}$$

$$\left[\begin{matrix} z_1(1+c)^{-k} \\ \vdots \\ z_r \end{matrix}\middle|\begin{matrix}(a_j;\alpha_j'...\alpha_j^{(r)})_{1,P}\,(1-\lambda;k)(1+\alpha+\beta-\lambda-\gamma,k);(c_j',\gamma_j')_{1,P_1};....;(c_j^{(r)};\gamma_j^{(r)})_{1,P_r} \\ (b_{ji},\beta_{ji}'...\beta_{ji}^{(r)})_{1,q}\;\;(1+\alpha-\lambda-\gamma,k)(1+\beta-\lambda-\gamma,k);(d_j',\delta_j')_{1,q_1};....;(d_j^{(r)};\delta_j^{(r)})_{1,P_r}\end{matrix}\right]$$

2. if we take R=1 and all $\alpha,\beta,\gamma,\delta$ equal to one in (3.1), it converted into integral involving G-function of multivariable.

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ARTICLE

17

FROM MARGINAL GROUP TO RULING CLASS

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Abstract:

Successful marginal group of the society is not the one that owns favourable programmes offered by government or have educated numbers or that have been able to gain financial capital but the relatively successful society is that which has captured the legislature with de-facto sovereignty.

Introduction

A marginalized group of the society in any nation is denied social, education, economic and political participation partially or fully. When they raise voice, government tries to put down their voices by providing facilities, programmes and even by making ministers from that community but never make the ruling class. Conversion from marginal to ruling class is possible only through capturing the legislature with de-facto sovereignty.

Objective

To know the method by which marginal group of the society can be converted into ruling class.

Methodology

Marginal group of the society in the present study is one which has been provided reservation in the government services on the basis of social, economic and education backwardness.

Literature review

Social status of a person is known by the status of the community to which he belong (Ambedkar, 1946). Reservation in Job is given to the poorest people (Cornell and Kalt, 1992). People belonging to reserved category live on fixed income which disables them to have social security and creates dismal employment opportunity for them(Dwyer, 2000). Act should intend to protect the tribe's land and to allow the creation of legal structures designed to help the tribe's govern themselves (Canby, 1988). A community which depends on outside decision making, continues on poverty (Kalt, 1996). The people belonging to depressed class became bonded labour because ownership of land, man and resources are not equally distributed in India (Heggarde, 1972). They suffered from variety of economic constraints because their route stands at lowest strata in Hindu Social system (Davis, 1959). Programmes intended to provide economic opportunities for reservation residents have failed in India (Mantonya and Milan, 2007). Therefore, it is suggested that the future course of action of the Tribal Community is to enforce the government not only to nationalise but also to declare land an industry (Ambedkar, 1946). So that economic equality be made in the society and Tribal community be converted into ruling class. Proper opportunity should be given to all members of the society which is only possible in an ideal society (Ambedkar, 1947). A strategy in the modern market economy should be applied with three steps (Kalt, 1996) (a) education directed to skills (b) financing to entrepreneurs efforts and (c) networking between potential entrepreneurs and their counterparts. Above that social and economic equality should be brought into effect to bring them into mainstream because social and economic inequality is detrimental to the health of the society (Lal and Clement, 2005). It has been rightly observed that successful tribes are not always the ones that own favourable natural resources of the ones that have educated tribal numbers or that have been able to gain financial capital (Deogaonkar, 2004). The relatively successful tribes need three indispensable ingredients (a) sovereignty (b) capable government (c) a match between the type of government a tribe has and that tribe's cultural norms regarding legitimate political power (Kalt, 1996).

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Analysis

A community can be marginalized on number of fronts. There are three interlinked fronts on which majority of the Indian populace have been marginalized and provided reservation in the Government services-Social, Economic and
Education.

Socially marginalized group of society is prohibited from participation in public life which lowers their morals, dignity and prestige. It creates the problem of social security and employment opportunity. It hampers national unity and integration as whole. They are treated as slaves. Slaves are discarded by the society for whom they work and no way can they get a respectable job (Annie Besent, 1909, Indian Review).

Economically marginalized group of society is prohibited from participation in economic activities. It increases poverty, income inequality, economic disparity, employment problems, labour shortages. It lowers the possibility of transfer of labour from agriculture to service and industry. It lowers national income, savings and investment.

Educationally marginalized group of society is prohibited from participation in educational activities. It lowers the availability of skilled labour to nation. It creates problems in availability of skilled human capital.

A community which is marginalized on above mentioned three interlinked fronts carries following characteristics-

(1) They are out of the political power because they are not united.
(2) They live on fixed income.

(3) They are out of the business activities.
(4) They are out of the decision making bodies at national level.
(5) They are out of the ownership of land, industry, capital and production system.
(6) Their representation is almost negligible in higher education, judiciary and defence.
(7) They don't have de-facto-sovereignty.
(8) They get subsistence wage.
(9) They are mostly engaged in the agricultural sector.
(10) They are socially subdivided into caste.

National problems

The nation whose majority of population is suffered from above characteristics, there can be following national problems-(1) Labour transfer will be very slow to match the decrease the share of agriculture in the national income (2) Agricultural sector will be predominated in the occupational structure (3) Income inequality will further rise across the social group, across the occupational sectors and across the profession. (4) Rural poverty will pull the leg of development (5) Nation will lack an ideal society comprising the social freedom and brotherhood. (6) Threat of national integration.

Efforts to solve the national problems

A number of the thinkers thought over the national problems associated with marginal group of the society in India. Shahuji maharaj, Jyotibha Phule,Periyar, Narayana Guru and Dr. B.R. Ambedkar are popular among them. They focused on educate, agitate and unite formula to convert them into ruling class through capturing the legislature. The prominence of legislature can be understood with the statement of Dr. Ambedkar (Poona Pact, 1932) "Gandhi has adopted an extreme course of starving to death not to secure a separate settlement for tribal community but to prevent them from securing a united number of representative chosen by their own people who will speak in the legislature on their behalf which will have a dominance influence over their future." On the basis of the Poona Pact, the marginal group of the society has been provided reservation in the government services with limited scope. However, no reservation policy has been implemented in Judiciary, Defence, and Upper house of the legislature, agricultural and industrial sector. Reservation in promotion has been not extended to Research institutes, University, Autonomous body and Undertaking and Banking.

Strategy

Their problems can only be solved when they shall capture the legislature with de-facto sovereignty because politics is the master key.

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Findings and Conclusion

Successful marginal group of the society is not the one that owns favourable programmes offered by government or have educated numbers or that have been able to gain financial capital but the relatively successful society is that which has captured the legislature with de-facto sovereignty.

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ARTICLE

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POST COLONIAL DRAMA: A STUDY OF GENDER DISCRIMINATION IN MAHESH DATTANI'S 'TARA'

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Abstract:

Drama is an important cultural performance of a society. Drama not only registered but also manifests the changes (social, political or cultural) the society undergoes. Thus, the study of drama would make enable to reconstruct the history, understand the society and comprehend its identity. Modern English drama can be taken into consideration to conceive the cultural identity of the society to which it belongs. Contemporary urban, middle-class English speaking stratum of Indian society is the society to which it belongs.

Introduction

When we consider Indian drama, obviously we are reminded of ancient drama. Ancient Sanskrit drama was so popular that the world recognizes India with ancient with that, *Natyasastra*. This book of Indian aesthetics details all kinds of performance and according to this book drama is the prominent form of performance. Ancient drama followed *Natyasastra* in every respect. The instruction of *Natyasastra* exhibits the culture of those days and also the social structure of ancient times. During this era theater enjoyed a key day for a long time before it saw a great gap of around then centuries i.e. till the advent of the British.

The rise of the modern drama dates back to the 18th century when the British Empire consolidated its stable power in India. Their policy of setting up English missionary schools for dual purpose i.e. preaching Christian religion and creating employees for British government induced Indian people to learn a new language—English and get the perception of Western World and their literature. In poured new strength in the paralyzed Indian English Drama. As *Krishna Kriplani* points out, the Modern English Drama "Owned its first flowering to foreign grafting". With the impact of Western civilization on Indian life, a new renaissance dawned on Indian arts including drama. Furthermore English education gave an impetus and a momentum to the critical study of not only Western drama but also classical Indian drama. English and Italian troupe toured India and performed many English plays mainly Shakespeare's plays, in cities like Bombay, Madras and Calcutta. The Portuguese brought a form of dance drama to the West Coast. A Russian music director Rededoff is said to have produced the first modern drama in Calcutta towards the end of the 18th century. Thus, the Western impact awakened.

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The dormant, critical impulse in the country to bring Indians face to face with new forms of life and literature and to open the way to a fruitful cross-fertilization of ideas and forms of expression" (K.R.S. Iyengar:4)

The real journey of Indian English Drama begins with Michael Madhu Sudhan Dutt's *Is this Called Civilization* which appeared on the literary horizon in 1871. Robindranath Tagore and Sri Aurobindo, the two great sage-poets of India are the first Indian dramatists in English worth considering. Tagore wrote primarily in Bengali plays are available to us in English renderings. His plays are firmly rooted in the Indian ethos and ethics in their themes, characters and treatment. Sri Aurobindo is a major voice in Indian English Drama. The most striking feature of Sri Aurobindo's plays is that they deal with the different cultures and countries in different epochs, ringing with variety of characters moods and sentiments. There is almost a global coverage in the total content of Sri Aurobindo's debt to Elizabethan drama is undeniable. The use of blank verse is flawless and in the right tune with the characters and situations. But at the same time we do not miss the impact of Sanskrit playwrights like Bhasa, Kalidasa and Bhavabhuti.

Other playwrights who have made significant contribution in the growth of Indian English drama are Harendranath Chattopadhay, T.P. Kailasen, Bharati Sarabhai, J.M. and Labo Prabhu and Sudhindra Nath Ghose. Although the pre-independence Indian English drama is notable for its poetic excellence thematic variety technical virtuosity, symbolic significance and its commitment to human values, it was by and large not geared for actual stage production.

In the post-independence era the most prolific playwright Asif Currimbhoy wrote and published more than thirtu plays on a wide range and variety of subjects matters. Quite a few contemporary playwrights made significant contributions to the development of Indian English Drama. Pratap Sharma wrote two plays which were staged abroad successfully, and Nissim Ezekiel also enriched Indian English Drama in his own characteristic way. Girish Karnad recipient of Jnanpith award is a living legend in the arena of contemporary Indian English Drama. Karnard's achievements as a playwright have received widespread recognition both nationally and internationally. He combines classical, folk and western theatrical traditions in his plays. His five plays which have been translated into English are steeped in Indian culture but his approach is modern. Others like Mohan Rakesh, Badal Sirkar, Vijay Tendulkar have also contributed in their own way towards this tradition.

The post modern era seems to be productive for Indian English Drama as it has received fresh impetus from young writers like Mahesh Dattani and Manjula Padmanabhan, R. K. Dhawan rightly observes: *"Very recently Indian English Drama has shot into prominence. Young writers like Mahesh Dattani and Manjula Padmanabhan have infused new life into this branch of writing."* Both Dattani and Padmanabhan project stark realism through their plays. Dattani showcases the mean, ugly and unhappy aspects of human life. The young Bangalore based Daltani is a promising playwright and has won the Sahitya Akademi Award for English literature for his play 'Final Solutions'.

Amar Nath Prasad rightly opines, "*Mahesh Dattani comes in the category of writers who champion the cause of true art frees from any theory, universal in taste and flavour, appealing to all sections of society, never bound to any*

caste, class and creed". *Theater,* according to Mahesh Dattani, *"is a reflection of what you observe. To do anything more would be to become didactic and then it ceases to be theatre".* (Amar Nath Prasad, 263)

Dattani is taken to be a true successor of Girish Karnad and responsible for the revolutionary progression of Indian English drama as a drama teacher, as a stage director, as an actor, as a Bharatnatyam dancer and as a sociologist explaining various complexities of society. Dattani belongs to the section of writers who established women at the centre of their fictional world and may be called avant-garde feminist. Dattani is to be estimated on two counts first his concern for the fair, sex and second his visit to the virgin landscapes; that is of homosexuals eunuchs, etc. Coming to his first option we have Kiran, the mistress of Masmukh in *Where there's a Will*; Ratna, the wife of Jairaj in 'Dance' like a Man', 'Tara, the feminist in the play Tara; Old Baa, Dolly and Alka in 'Bravely Fought the Queen'; Deepali in *A Muggy Night in Mumbai;* Gowda and Lata in *Do the Needful,* and Uma in *Seven Steps Around the Fire*. Here we find feminine question for identity and dilemma of feminine sensibility to an extent that it brings forth the colonial perspectives of society. (Gauri Shankar Jha, pp. 93-95)

Dattani does not seek to cut a path through the difficulties his characters encounter in his plays; instead he leads his audience to see just how caught up we all are in the complications and contradictions of our values and assumptions. Dattani's *Tara* seeks to purge the scum layered in the mind in many field. The playwright shares the anguish of gender discrimination in society. Basically, the play 'Tara' is related with the issue of gender bias. It is a pathetic representation of the suffering of two Siamese twins, a boy and a girl who are surgically separated at birth. It was important for their survival and the play deals with their emotionally separation.

The plot of *Tara* is arranged around familial relationship where each individual in his own way has to bear the burden of social values and their efforts to go beyond them, bring helplessness in their lives. In *Tara* after the marriage of Mr. Patel and Bharti, the former was forced to leave his parental home because he had married against his parents' wishes. The shadow of insecurity looms large around him. He had a painful realization-the separation from his parents and the subsequent birth of Siamese twins makes him feel more isolated. He was forced to decide for the surgery of the twins for their survival and the consequent tragedy was imminent. The surgery renders Tara cripple and Bharti goes insane and Mr. Patel becomes violent and aggressive. She ignores the identity of Tara and turns her back to the consequences involving the risk to life Tara. So here is a direct picture of gender prejudice prevalent in our society. Tara as daughter experiences maltreatment and partiality from her mother as compared to her brother Chandan. Dattani in this play establishes the fact that even mother and daughter relationship is ultimately subordinated to the directions of patriarchy.

"Yes, call me a liar, a wife beater, a child abuser. It's what you want me to be! And you. You want them to believe you love them very much" (354). Again he tells Tara: *"Tara please believe me when I say that I love you very much and I have never in all my life loved your brother. But your mother…"* (354). But Tara has always been led to believe that it is she who has been discriminated against by her father, and always gained the extra bit of affection from her mother.

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This is why the play generates a death-like response from Tara when she learns to truth. She was discriminated against, because of her gender, but not by her father-it was Bharatis decision that deprived her of what she wanted more than anything else in the world-a second leg. It is a shattering discovery for the naturally ebullient Tara: *"And she called me her star!"* (379). This is the crucial moment in the play that practically from the male, and Chandan moves far away, never to return, forever, incomplete. The bereft divided self of Dan renders its final apology to its significant other-Tara: "Forgive me, Tara, Forgive me for making it my tragedy" (380).

The play Tara without debate is a tragedy of the conformation of individual choices against social conventions. Through this play an attempt has been made to highlight Dattani's innovative approach against conventional cannons and his daring spirit to bring new and radical issues like gender identity in theater. Through his creative medium Dattani has proven that drama is not a mechanical representation of human experience but also a lively representation of new dynamics of social relationship. In a nutshell Dattani has depicted the views of Indian society regarding gender identity very explicitly through *Tara.*

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THE END

ARTICLE

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भारत की तिब्बत निति व चीनी प्रतिक्रिया : एक राजनैतिक विशलेषण

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सारांश

भारत चीन संबंधों को प्रभावित करने वाला एक महत्वपूर्ण तत्व तिब्बत है तिब्बत भारत व चीन के बीच बफर राज्य है साथ ही तिब्बत के साथ प्राचीन काल से ही भारत के व्यापरिक व सांस्कृतिक संबंध रहे है। 18वीं शताब्दी में छठे दलाई लामा के उत्तराधिकार के प्रश्न पर तिब्बत व मंगोलिया में तीव्र मतभेद उत्पन्न हुए तत्पश्चात् चीन ने तिब्बत की राजधानी ल्हासा पर अपना नियंत्रण स्थापित करके स्वेच्छा से सातवें दलाई लामा का चयन किया और उन्नीसवीं शताब्दी में तिब्बत को चीन का भाग घोषित किया।

वास्तव में द्वितीय विश्वयुद्ध के बाद चीन इस स्थिति में नहीं था कि वह तिब्बत पर अपना नियंत्रण रख सके क्योंकि उस समय तिब्बत यह दावा कर रहा था कि वह एक स्वायत्त प्रदेश है और भारत उसकी स्वायत्तता का पक्षधर था लेकिन अचानक भारत सरकार ने 30 दिसम्बर 1949 को चीन को मान्यता देते हुए तिब्बत को चीन का अधीनस्थ राज्य स्वीकार कर लिया भारत की यह ऐतिहासिक भूल आज भी गंभीर समस्या बनी हुई है। भारत की इस कूटनीतिक कमजोरी का लाभ उठाते हुए चीन ने 1959 में तिब्बत को हड़प लिया जिसका विरोध भारत ने किया और तिब्बत के धर्मगुरू दलाई लामा को भारत में शरण दी। भारत द्वारा की गई इस कार्यवाही को चीन ने अपने आन्तरिक मामले में हस्तक्षेप माना और भारत की कड़े शब्दों में आलोचना की। वास्तव में दलाई लामा को तिब्बत से भगाने में भारत का कोई हाथ नहीं था फिर भी भारत पर विस्तारवादी होने का आरोप लगाया गया। इस प्रकार भारत व चीन के बीच शीतयुद्ध आरंभ हो गया। 1962 के भारत चीन युद्ध के लिए काफी हद तक तिब्बत को ही जिम्मेदार ठहराया गया जबकि वास्तविक कारण चाहे कुछ भी रहा हो। परिणामस्वरूप भारत व चीन के सम्बन्ध अत्यन्त कटु हो गए।

प्रस्तावना

तिब्बत, भारत व चीन के बीच बफर राज्य है, साथ ही वह भारत की आस्था नगरी भी रहा है भारतीय धर्म के अनुसार भगवान शंकर का निवास स्थान कैलास पर्वत व मानसरोवर झील तिब्बत के ही भाग है किन्तु वर्तमान में तिब्बत के चीन के नियंत्रण में गए हुए लगभग 6 दशक पूरे हो चुके है साथ ही चीन में कम्युनिस्ट पार्टी को सत्ता पर आसीन हुए भी लगभग 6 दशक पूरे हो चुके हैं किन्तु कम्युनिस्ट पार्टी ने ये सत्ता जनमत से नहीं वरन् बंदूक के बल पर प्राप्त किया है। तब से लेकर आज तक चीन हर पड़ोसी देश पर गिद्ध जैसी दृष्टि जमाए रखता है और अवसर मिलते ही कब्जा करने की कोशिश करता है चीन अपनी इस नीति के अन्तर्गत मंचूरिया पूर्वी, तुर्किस्तान ओर लगभग आधे मंगोलिया पर तो पहले ही कब्जा जमा लिया था।

तिब्बत ही एक मात्र ऐसा देश था जो अब तक चीन के कब्जे से बचा हुआ था। इसका मतलब यह नहीं है कि चीन ने तिब्बत को हथियाने का प्रयास नहीं किया बल्कि इस हेतु तिब्बत काफी समय से प्रयत्नशील था किन्तु उस समय उसे सफलता नही मिल पा रही थी।

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कभी तिब्बत के लोग चीन को हराकर उसके भू–भाग पर कब्जा कर लेते तो कभी चीन तिब्बत के भीतर घुस जाता था। एक अवसर तो ऐसा भी आया जब तिब्बत ने चीन को बुरी तरह से पराजित कर उसके बड़े भू–भाग पर कब्जा कर लिया और समझौते के रूप मे चीन के राजा को अपनी लड़की की शादी तिब्बत के राजा से करनी पड़ी थी जिसके परिणामस्वरूप चीनियों ने अपनी रक्षा हेतु उस दीवार का निर्माण करवाया जिसे आज दुनिया के सात आश्चर्यों में गिना जाता है। चीनी लोग तिब्बतियों को बर्बर मानते हैं और उनसे भयभीत रहते थे। परिणामस्वरूप तिब्बती भी चीनियों के लिए बुरे अथवा राक्षस चीनी शब्द का प्रयोग करते थे, किन्तु तिब्बतीयों के मन में भारत के प्रति अगाध श्रद्धा व आस्था थी।

तिब्बत, चीन व भारत के मध्य जब तक था उस समय तक भारत की सीमा कहीं भी चीन से नहीं मिलती थी किन्तु जब चीन ने तुर्किस्तान को मिला लिया तब वह एक छोटी सी सीमा के साथ भारत में उपस्थित हुआ तब से भारत के लिए तिब्बत के स्वतंत्र अस्तित्व के बने रहने की अनिवार्यता बहुत अधिक बढ़ गई इस स्थिति को स्वतंत्रता के पूर्व ब्रिटिश शासन अच्छी तरह से जानती थी इस हेतु उन्होनें जो रणनीति अपनाई वह तिब्बत के लिए अत्यन्त घातक सिद्ध हुई अपने इसी उद्देश्य की पूर्ति हेतु ब्रिटिश भारत ने तिब्बत पर आक्रमण कर दिया जिसमें तिब्बत पराजित हुआ। तब चीनी सरकार ने इंग्लैण्ड की मानसिकता को समझ कर ब्रिटिश सरकार पर दबाव डाला कि वह तिब्बत के साथ सीधे सन्धि न करें, क्योंकि तिब्बत चीन का हिस्सा है उस परिस्थिति में ब्रिटिश सरकार को भी यह सुविधाजनक प्रतीत हुआ क्योंकि तिब्बत पर नियंत्रण स्थापित करना ब्रिटिश भारत के लिए संभव नहीं था।

अतः ब्रिटिश भारत ने यह स्वीकार कर लिया कि तिब्बत पर चीन का अधिराज्य है किन्तु तिब्बत ने यह कभी स्वीकार नहीं किया कि वह चीन का हिस्सा है यहां तक कि तेरहवें दलाईलामा ने समस्त चीनियों को तिब्बत से एक बार बाहर भी निकाल दिया था। दूसरी तरफ ब्रिटिश सरकार अच्छी तरह से जानती थी कि तिब्बत व्यावहारिक रूप से एक स्वतंत्र देश है इस हेतु उसने 1914 में शिमला में तीन देशों की एक सभा आयोजित की, जिसमें भारत, चीन और तिब्बत के प्रतिनधियों ने भाग लिया जिसमें एक संधि का प्रारूप तैयार किया गया। जिसे भारत और तिब्बत ने तो स्वीकार कर लिया किन्तु चीन बातचीत को और लंबा खीचने का प्रयास कर रहा था, जब यह निर्णय लिया गया कि तिब्बत व चीन के बीच की सीमा की समस्या को दोनों देश आपस में सुलझाते रहेंगे, लेकिन जहॉ तक भारत का प्रश्न है, ये दोनों ही आपस में कोई भी निर्णय कर सकते हैं। जिसके अन्तर्गत भारत व तिब्बत के बीच परम्परागत रूप से चली आ रही सीमा रेखा को मानचित्र में खींचने का कार्य मैकमोहन ने किया तत्पश्चात् भारत व तिब्बत की सीमा रेखा मैकमोहन रेखा कहलाई।

स्वतंत्र भारत में पण्डित जवाहरलाल नेहरू के नेतृत्व में भारत ने एशिया के देशों की एक सभा दिल्ली में आयोजित की जिसमें तिब्बत व चीन को अलग–अलग देशों के रूप में आमंत्रित किया, जिसमें दोनों ने ही अपने प्रतिनिधिमण्डल इस सम्मेलन में भेजे थे। 1947 में भारत सरकार के स्वतंत्र होने व 1949 के चीनी सरकार के स्वतंत्र होने के पश्चात् माओ ने अपने सबसे पहले उद्देश्य तिब्बत पर कब्जा करने हेतु आक्रमण कर दिया जिसमें तिब्बत ने भारत से सहायता हेतु संपर्क किया।[3]

उसी समय सरदार पटेल ने एक ऐसा ही पत्र पण्डित जवाहर लाल नेहरू को लिखा था कि चीन का तिब्बत पर आक्रमण अप्रत्यक्ष रूप से भारत पर ही आक्रमण माना जाना चाहिए, क्योंकि यदि चीन तिब्बत पर कब्जा कर लेता है तो वह एकदम से भारत के नजदीक आ जायेगा और सम्पूर्ण हिमालय की सुरक्षा खतरे में पड़ जायेगी किन्तु, पण्डित नेहरू ने तो तिब्बत के अर्न्तनाद को सुना और न ही सरदार

पटेल की चेतावनी को, तिब्बत की सहायता तो दूर की बात थी। इसके अलावा तिब्बती प्रतिनिधि सहायता के लिए भारत आये और यहां से निराश होकर इंगलैण्ड व अमेरिका जाना चाहते थे, किन्तु उन दोनों ही राष्ट्रों का मानना था कि तिब्बत का मसला मूलतः भारत का मसला है और यदि भारत सरकार सहायता देने की रणनीति बनाता है तो वे भी सहायता कर सकते हैं।

किन्तु भारत की दृष्टि में तिब्बत चीन का स्वायत्त देश है। ऐसी अवस्था में तिब्बत सरकार का प्रतिनिधि मण्डल बीजिंग गया। अकेला और निहत्था तिब्बत अपनी स्वतंत्रता की रक्षा के लिए अंतिम कूटनीतिक लड़ाई लड़ रहा था, किन्तु चीन सरकार ने उस प्रतिनिधिमण्डल को धमकाकर व बुरे परिणाम का भय दिखाकर एक 17 सूत्रीय संधि पर हस्ताक्षर करवा लिये। उस समय भारत में तिब्बत के धर्मगुरू दलाई लामा भारत की सीमा के नजदीक तिब्बत में यातुंग नामक स्थान पर ठहरे थे इस प्रतिनिधि मण्डल को लौटने पर उन्हें इस बात का निर्णय करना था कि वे भारत में शरण ले या फिर वापिस ल्हासा जायें। लेकिन प्रतिनिधि मण्डल के साथ बीजिंग में जो कुछ हुआ उसकी जानकारी आकाशवाणी से उन्हें पूर्व में हो चुकी थी। ऐसी स्थिति में दलाई लामा ने वापस ल्हासा जाने व तिब्बत के धर्म व संस्कृति की रक्षा करने का निर्णय लिया तब दलाई लामा भी वापस ल्हासा पहुॅचे और चीनी सेना भी ल्हासा पहुॅच गई। इस संदर्भ में चीनी सरकार का कथन था कि यह सेना तिब्बत के निमंत्रण पर आयी है। दूसरी तरफ भारत सरकार का कहना था कि तिब्बतियों को चीनियों के साथ रहने का अभ्यास करना चाहिए। इसी समय चीन व भारत ने 1954 में पंचशील के ऐतिहासिक सिद्धांत पर हस्ताक्षर किया और इस सन्धि के पश्चात् चीनी शासन का शिकंजा तिब्बत पर और भी मजबूत हो गया और 1959 में चीनी सेना ने एक नाटक दिखाने के बहाने दलाई लामा को गिरफ्तार करके बीजिंग ले जाने की योजना बनाई जिसकी जानकारी तिब्बतियों को लग गई थी और लाखों तिब्बती दलाई लामा के महल के चारो तरफ एकत्रित हो गयी, रात्रि के अंधेरे में दलाई लामा महल छोड़कर काफी लंबी यात्रा के बाद 31 मार्च को दिल्ली पहुॅचे और भारत सरकार ने उन्हें शरण दी। लेकिन उधर तिब्बत में तिब्बतियों का विद्रोह नियंत्रण में नहीं रहा था। चीनी सेना ने पूरे बल से उसका दमन किया जिसमें न जाने कितने तिब्बती मारे गये, जिसका आज तक अनुमान नहीं लगाया जा सकता है। लेकिन कुछ तिब्बती मारे गये हैं इस बात को चीनी सरकार भी स्वीकार करती है। वर्तमान में पूरी तरह से चीन के कब्जे में चला गया है।4

पंचशील की संधि 1962 में खत्म हुई जिसकी आशंका सरदार पटेल को पहले से थी और वैसा ही हुआ और चीन ने भारत पर 1962 में आक्रमण कर दिया। भारत सरकार इस लड़ाई के लिए न तो मनोवैज्ञानिक रूप से तैयार थी और न ही सैनिक दृष्टि से। इस युद्ध में भारत की पराजय हुई और चीन ने भारत का भी एक बहुत बड़ा भाग अपने कब्जे में ले लिया।[5]

14 नवम्बर 1962 को भारत की संसद ने सर्वसम्मति से प्रस्ताव पारित किया कि चीन के कब्जों में गई एक–एक इंच भूमि को मुक्त करवाया जायेगा चाहे उसके लिए कोई भी तरीका अख्तियार करना पड़े। उसी समय चीन का तिब्बत के खिलाफ खतरनाक अभियान जारी था इसके लिए उसने तिब्बत के मन्दिर व मठ गिरा दिए, पुस्तकालयों को जला दिया गया, तिब्बती लड़कियों की शादी बलपूर्वक चीनी लड़कों से करवाई जा रही थी, करोड़ों चीनियों को तिब्बत में बसाया जा रहा था ताकि अपने ही देश के तिब्बती अल्पसंख्यक हो जाऍं, तिब्बती भाषा को समाप्त करने के लिए प्राथमिक स्तर पर ही चीनी भाषा को अनिवार्य घोषित किया गया और सरकारी नौकरी के लिए भी चीनी भाषा को ही प्राथमिकता दी गई।

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तिब्बत के लोग इतने वर्षों के बाद आज भी आजादी के लिए संघर्षरत हैं। जो कि पूर्णतया अहिंसातमक है। वे आत्म बलिदान दे रहे हैं। चीनी जेलों में सड़ रहे हैं। दलाई लामा का चित्र मात्र रखने से उन्हें अनेक वर्षों तक जेलों में सजा काटनी पड़ती है। वहॉ दलाई लामा का नाम तक लेना गुनाह है। पंचेन लामा को दस साल से भी ज्यादा समय से परिवार समेत जेल में रखा गया है। तिब्बत के खनिज पदार्थों का अवैधानिक ढंग से दोहन किया जा रहा है। वनों को निर्दयता से काटा दिया जाता है। चीन ने तिब्बत का इस्तेमाल परमाणु कचरा डालने के लिए कचरापेटी की तरह किया है। तिब्बत में जो आर्थिक प्रगति हुई उसका लाभ वहॉ के चीनियों को मिल रहा है। तिब्बती या तो मजदूरी करते हैं या भीख मांगते हैं। चीन की सैनिक आवश्यकता की पूर्ति के लिए तिब्बतियों को सस्ती मजदूरी के तौर पर इस्तेमाल किया जा रहा है।[6]

भारत यह सब देखते हुए या तो चुप है या फिर बोलना नहीं चाहता है। चीनी सरकार भी भारत की इस नीति को अच्छी तरह से समझ गई है। इस हेतु चीनी सरकार ने बीजिंग से ल्हासा व अरूणांचल में सड़कों का भी निर्माण कर लिया है और अब नेपाल और भारत की सीमा में रेलवे लाइन बिछाने जा रहा है। जबकि भारत में तिब्बत व अरूणांचल की सीमा में दूर–दूर तक सड़कों का नामोनिशान तक नहीं है।7 अरूणांचल प्रदेश के मुख्यमंत्री के अनुसार चीन ने प्रदेश में 250 से ज्यादा बार भारतीय सीमा का अतिक्रमण कर चुका है। इस संबंध में भारत सरकार की निर्लज्जता काबिले गौर है। उसका कहना है कि भारत व चीन के बीच अभी तक सीमा सुनिश्चित नहीं है। आश्चर्य है कि भारत व चीन की सीमा को लेकर जो रवैया चीन सरकार का है।[8]

हैरानी है कि भारत सरकार ने भी चीन के रवैये को ही दोहराना शुरू कर दिया है। जबकि वास्तविकता यह है कि भारत व तिब्बत के बीच की सीमा शताब्दीयों से परम्परागत रूप से निश्चित और मान्य है। जिसे भारत व चीन दोनों स्वीकार करते थे तभी तो 1962 के युद्ध के बाद वे अपनी पूर्व स्थिति में वापस चले गये थे।

विश्लेषण –

भारत के सांस्कृतिक संसार में तिब्बत को देवताओं की क्रीड़ास्थली माना गया है। तिब्बत वह स्वर्ग है जहॉ कल्पवृक्ष था नंदन कानन था और जहॉ कामधेनु विचरण करती थी। संस्कृत के प्राख्यात प्राचीन ग्रन्थ अमरकोष में तिब्बत को स्वर्ग का पर्यायवाची बतलाया गया है। यहीं हमारे देवाधिदेव महादेव का क्रीड़ा पर्वत कैलाश गंगा की तरह पवित्र मानसरोवर झील है, पक्षराज धनपति कुबेर की अल्कापुरी कभी तिब्बत की ही गोद में बसी थी जहॉ पर मोती चुनने वाले हंस विचरण करते थे।

यह अजीब विडंबना है कि जिस तिब्बत पर चीन का कब्जा है और जिसे वह अपना अंग बताता है उस तिब्बत का चीन से कुछ भी नहीं मिलता है। तिब्बती चीन से बिल्कुल अलग भाषा, नस्ल, संस्कृति व धर्म के लोग है। जबकि तिब्बती लिपि भारतीय है, यह गुप्तकाल के ब्राम्ही लिपि से विकसित हुई है जिसे भारती विद्वानों के द्वारा ही तिब्बत के लिए तैयार किया गया था। कैलेण्डर भी भारत की ही तरह

चॉद व सूर्य दोनों का सम्मिलत रूप है। तिब्बत व चीन के बौद्ध धर्म में भी अंतर है। चीन धर्म प्रणाली तत्काल सिद्धान्त प्रणाली पर आधारित है तथा वे 10 मार्च के आसपास अपना नववर्ष मनाते हैं।

तिब्बत के प्रति विश्व दृष्टि, चीन दृष्टि एवं खुद दलाई लामा के विचार जानने के उपरान्त तिब्बत के पड़ोसी एवं दलाई लामा समेत लगभग डेढ़ लाख तिब्बतीयों को अपने देश में शरण देने वाले भारत की तिब्बत के संदर्भ में क्या भूमिका रही है इसके ऑकलन के बिना समस्त चर्चा अधूरी रह जाएगी।

भारत व तिब्बत के महत्व सदियों से आध्यात्मिक व सांस्कृतिक संबध रहे हैं, क्योंकि तिब्बती बौद्ध धर्मावलम्बी है और बौद्ध धर्म की जन्मस्थली भारत है। वास्तव में तिब्बत समस्या का जब और जैसा भी समाधान होगा उससे भारत भी प्रभावित होगा। क्योंकि तिब्बत समस्या से भारतीय हित भी जुड़े हुए हैं। यद्यपि 1950 में तिब्बत पर चीनी आक्रमण की भारत ने निंदा की थी लेकिन 1954 ई में चीन के साथ पंचशील समझौते में तिब्बत पर से अपने समस्त विशेषाधिकारों का परित्याग करने के पश्चात् भारत ने एक प्रकार से तिब्बत के चीन में विलय को मान्यता दे दी।

1951 में संयुक्त राष्ट्र में अब साल्वाडोर द्वारा तिब्बत का प्रश्न उठाने का मामला रहा हो या 1999 में जेनेवा में अमेरिका द्वारा चीन के मानवाधिकार हनन पर चर्चा हेतु प्रस्ताव लाने की बात रही हो, भारत ने अत्यन्त दुर्भाग्यपूर्ण ढंग से चीन के पक्ष में खड़े होकर तिब्बत के प्रश्न को विश्व मंच पर नहीं उठने दिया। यहॉ तक कि लाल बहादुर शास्त्री व अटल बिहारी वाजपेयी तिब्बत को चीन का अंग मानने के प्रति अपनी आस्था दर्शाने वाले वक्तव्य ही देते नजर आए है। 1989 में विपक्ष में रहने के दौरान अटल बिहारी वाजपेयी ने राज्यसभा में कहा था कि तिब्बत को स्वतंत्र होने का अधिकार है और पंडित नेहरू ने तिब्बत को स्वतंत्र देश न मानकर एक भारी भूल की थी। भारत में मार्क्सवादी कम्युनिस्ट पार्टी को छोड़कर लगभग सभी दल सैद्धान्तिक रूप से तिब्बती आजादी के समर्थक है। 1989 में भारतीय प्रधानमंत्री राजीव गांधी वे दोनों ही तिब्बत के प्रश्न व पर बचते रहे व न्यूनतम टिप्पणी दी। इसके अलावा चीनी सरकार द्वारा किए जा रहे तिब्बत के मानवाधिकार उल्लंघन के प्रश्न पर अन्तर्राष्ट्रीय समुदाय के साथ–साथ संगठन भी चुप्पी साधे हुए है जबकि कश्मीर के प्रश्न पर समस्त अन्तर्राष्ट्रीय समुदाय अपना वक्तव्य देने से कभी पीछे नहीं हटते। यहॉ तक कि अन्तर्राष्ट्रीय शान्ति की ठेकेदारी का दम भरने वाला अमेरिका भी इस मामले में न जाने क्यों चुप्पी साधे है जबकि चीन के लाखों तिब्बतियों को जान से मारने घर से बेघर करने व शारीरिक व मानसिक प्रताड़ना जैसे कार्यों पर न तो कोई राष्ट्र आवाज उठा रहा है न ही संगठन। दूसरी तरफ चीन का कथन है कि इन सारे उत्पात की जड़ भारत है।

चीनी राष्ट्रपति हू जिंताओ का कथन है कि यह टकराव देश की अखण्डता को लेकर है और बातचीत में रूकावट स्वयं दलाई लामा की तरफ से है। वर्तमान अन्तर्राष्ट्रीय परिस्थिति में भारत को तिब्बत चीन व अमेरिका के मध्य समन्वय बनाए रखना एक महत्वपूर्ण चुनौती है। उधर चीन के तिब्बती नागरिकों ने इसके लिए कम्युनिस्ट सरकार को ही दोषी ठहराया हैं और तिब्बती धर्म गुरू तिब्बत के मसले को अन्तर्राष्ट्रीय स्तर पर लाने के लिए विभिन्न देशों की यात्रा कर रहे हैं जिसमें उन्हें निराशा ही हासिल हुई है क्योंकि उन राष्ट्रों का मानना है कि यदि इस समस्या के समाधान हेतु भारत आगे आकर प्रयास करता है तो वे भी इस दिशा में कदम उठा सकते है किन्तु इस समस्या हेतु न जाने क्यों भारत का रवैया अस्पष्ट है और वह स्वतंत्र वक्तव्य नहीं दे पा रहा है ऐसा नहीं है कि उसके ऐसा करने से 1962 की ऐतिहासिक घटना का दोहराव हो जाएगा और भारत को हार का सामना करना पड़ेगा। वर्तमान में परिस्थितियॉ बदल गई हैं 1962 और आज की स्थिति में अत्यन्त परिवर्तन आ गया है और भारत को निष्पक्ष होकर इस हेतु प्रयास करना चाहिए।

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समाप्त

ARTICLE

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गोंड़ जनजाति–एक समाजशास्त्रीय अध्ययन(शहडोल जिले के विशेष सन्दर्भ में)

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सारांश

गोंड़ जनजाति शहडोल के जिले के हर विकासखण्ड में बहुतायत मात्रा में पाये जाते है, जिनका इष्टदेव बड़ादेव है इस जाति में कई पत्यिों रखने की प्रथा पूर्व से चली आ रही है इनमें से कई बड़े भूमि स्वामी भी है, पूरा गोंड़ समुदाय बड़ादेव यानि महादेव के उपासक हैं, उनका मानना है, कि महादेव सभी देवी देवताओं में श्रेष्ठ है, यह जाति गोत्र प्रधान है जैसे नेताम, मरावी, परस्ते, धुर्वे, उइके मरकाम आदि इसी उपनाम के आधार पर नामकरण संस्कार से लेकर पूजा–पाठ, शादी विवाह, मृत्यु उपरान्त किये जाने वाले क्रिया कर्म, दाह संस्कार, दशगात्र जैसे संस्कारों का निर्वहन किया जाता है, इन सभी क्रिया कलापों के निर्वहन हेतु गोत्र अनुसार पृथक–पृथक महापात्र होते हैं, जिन्हें परधान या पठारी कहा जाता है, जो गोंड़ जनजाति जैसा है, परन्तु इस जनजाति का जीवन पुराने गोंड़ राजाओं महाराओं की वीरता पौरूषता की गाथा एक विशेष वाद्य यन्त्र की सहायता से गाकर बजाकर सुनाते हैं जिनके बदले बख्शीश के रूप में रूपया पैसा, सोना चॉदी, गाय बैल, घोड़ा आदि दिये जाने का प्राचीन काल से गोंड़ जनजाति में प्रचलन था जो आज भी ग्रामीण क्षेत्रों में प्रचलन में है जो क्रमशः धीरे–धीरे आधुनिकीकरण, शहरीकरण, औद्योगीकरण तथा शिक्षा के क्षेत्र में हुये विकास के कारण प्रायः लुप्त होता जा रहा है।

प्रस्तावना

हमारा देश तीव्र गति से विकास की ओर अग्रसर है वही जंगलो में ऐसे लोग निवास कर रहे है, जो आधुनिक उपलब्धियों से आहुत संस्कृति के वर्तमान स्वरूप से सर्वथा अपरिचित कृषि, उद्योग–धन्धों, शिक्षा आदि से अनभिज्ञ तथा आदिमानव से कुछ ही अधिक विकसित है, ये अपने सीमित साधनों से केवल जीवित रहना ही सीख सके हैं ओर आज भी विज्ञान की चकाचौध व सभ्यता की होड़ से अपरिचित है। ऐसे ही अपरिचित लोगों का उल्लेख भारतीय संविधान में अनुसूचित जनजाति के रूप में किया गया है।

मध्यप्रदेश देश का एक ऐसा राज्य है, जहॉ हर तीसरा व्यक्ति अनुसूचित जाति अथवा अनुसूचित जनजाति वर्ग का है। म0प्र0 में अनुसूचित जाति की कुल संख्या 91.55 लाख है। देश की कुल संख्या 122.33 लाख है। देश की कुल अनुसूचित जनजातियों लगभग 22 प्रतिशत भाग इसी राज्य में निवास करता है। 2001 की जनगणना के अनुसार जनजातियों की ग्रामीण जनसंख्या का प्रतिशत 93.56 है। शहरी अनुसूचित जनजातियो की जनसंख्या का प्रतिशत 6.43 है। प्रदेश की ज्यादातर अनुसूचित जनजातियों का प्रतिशत दूरस्थ ग्रामीण क्षेत्रों, जंगली व पहाड़ी स्थानों पर निवास करती हैं। म.प्र. में 43 जातियों को अनुसूचित जनजाति समूह में शामिल किया गया है।(जैन2003) अनुसूचित जनजातियों के सामाजिक और सास्कृतिक जीवन में काफी अन्तर रहा है। इसका कारण सामाजिक स्तरीकरण है जो सभ्य समाज के प्रभाव के कारण तथा एक समूह से दूसरे समूह से भौगोलिक दूरी को प्रभावित नही किया है। अपित उनसे उन्होने बहुत से विश्वासों व परम्पराओं को भी ग्रहण किया है।

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दिनेश पाटीदार एवं ज्ञान प्रकाश (2006) के अनुसार जनजातीय कार्यवाही संचार माध्यमों की कमी और संक्रमण के कठिन दौर से गुजर रहे हैं। वह आर्थिक सामाजिक, राजनैतिक एवं सास्कृतिक समस्याओं से घिरे हुए है।

श्री नाथ शर्मा ने (1993) जनजातीय समाजशास्त्र में दरिद्रता एवं निर्धनता, अशिक्षा, परम्परागत कृषि, बेगारी, ऋणग्रस्तता और वन सम्बन्धी नियम और विकास की अवधारणा से निर्मित जनजातीय समस्या को देखा है।

कोल ने (1993) जनजातियों पर नगरीकरण के प्रभाव पर लिखा। अनुसूचित जनजाति की वर्तमान आर्थिक स्थिति को देखने से स्पष्ट होता है कि विकास की दृष्टि से देश के कमजोर वर्ग से भी पीछे है। अतः उनके आर्थिक सुधार में शासन की भूमिका अहम होनी चाहिए।

विराज दुबे एवं वंदना (1998) ने गोड़ जनजाति में सामाजिक सास्कृतिक परिवर्तन एवं विकास के अध्ययन में पाया कि भौतिक संस्कृति में आधुनिक जीवन शैली देखने को मिलती है।

शहडोल जिला मध्य प्रदेश का जनजातीय बाहुल्य जिला है सम्पूर्ण जिले की कुल जनसंख्या 908148 हैं जिसमें जनजातियों की संख्या 391027 है पुरूषों की जनसंख्या 196684 एवं महिलाओं की जनसंख्या 184343 है जो कुल जनसंख्या का 43 प्रतिशत है जनजातीय बाहुल्य क्षेत्र होने के कारण भारत सरकार की दि शेड्यूल एरियाज एण्ड ट्राइब्ज कमीशन ने पॉचवी अनुसूची में इस जिले को शामिल किया हैं, शहडोल जिले में प्रमुख रूप से गोंड़, बैगा, कोल, कॅवर, पाव, भरिया, पनिका तथा अगरिया जनजातियां पाई जाती हैं, जिनमें गोंड़ जनजाति की जनसंख्या सबसे अधिक है, वर्ष 2001 में कराये गये जनगणना अनुसार शहडोल जिले की जनसंख्या 1575305 थी. जिसमें जनजातियों की जनसंख्या 700651 थी, परन्तु शहडोल जिले की सीमाओं को विभाजित कर दो नवीन जिले उमरिया एवं अनूपपूर गठित हो जाने से जनजातियों की जनसंख्या भी जिलेवार विभाजित हो गई है, विभाजन पश्चात् इस जिले में शेष बचे गोंड़ जनजातियों के सामाजिक परिवर्तन पर विस्तृत अध्ययन नहीं किया गया है।

वर्तमान आधुनिकीकरण एवं नगरीकरण का प्रभाव सभी जनजातियों पर पड़ा है जिसमें गोंड़ जनजातिया भी निश्चित रूप से प्रभावित हुई है, परन्तु इस जनजाति पर प्रभाव किस स्तर पर पड़ा है उनके विकास की स्थिति क्या है नगरीय संस्कृति का प्रभाव किस तरह उनके सामाजिक परिवेश को प्रभावित कर रहा है आदि तथ्यों की जानकारी प्राप्त करना शोध का प्रमुख उद्देश्य है।

प्रदेश सरकार द्वारा जनजातीय बाहुल्य क्षेत्रो को विकसित करने के लिए एकीकृत आदिवासी विकास परियोजनाये संचालित की गई है, जिनमें विकास खण्ड सोहागपुर, गोहपारू एवं बुढ़ार हेतु सोहागपुर में तथा विकास खण्ड जयसिंहनगर एवं ब्यौहारी हेतु जयसिंहनगर में एकीकृत आदिवासी विकास परियोजनायें वर्तमान में संचालित है केन्द्र सरकार द्वारा भी पॉचवी अनुसूची लागू कर जिले के 5 विकास खण्डों में से 4 विकास खण्डों के सरपंच एवं जनपद अध्यक्ष के पद 100 प्रतिशत जनजाति वर्ग के लिये आरक्षित किये गये हैं जिनमें किसी अन्य वर्ग का व्यक्ति सरपंच या जनपद अध्यक्ष नहीं हो सकता।

शहडोल जिला अभी भी मध्य प्रदेश का काफी पिछड़ा हुआ जिला है, अभी भी शिक्षा का प्रतिशत यहॉ बहुत कम है गोंड़ जाति अधिकॉश दूर–दराज के ग्रामीण क्षेत्रों में निवास कर रही है जिनका जीवन यापन का मुख्य साधन कृषि या कृषि मजदूरी है एकीकृत आदिवासी परियोजनायें संचालित होने के बावजूद उतना विकास नहीं हो पाया।

गोंड़ जनजाति अन्य जनजातियों की तुलना में बहुसंख्यक होने के बावजूद क्या परिवर्तन ला पाई है, क्या वह अभी भी अंधविश्वास एवं रूढ़िवादिता के जॉल में फॅसी हुई है साथ ही इस जनजाति की महिलाओं की स्थिति क्या है आदि का भी विश्लेषण किया जाना

आवश्यक है, इन सभी की जानकारी प्राप्त करने की पूर्ण प्रयास करने हेतु ही इस विषय को अध्ययन हेतु चुना गया है।गोंड़ जनजातियों मूल रूप से कृषि एवं वनोपज पर निर्भर है, अनेक पाश्चात्यवर्ती अध्ययनकर्ताओं ने विशेषकर एम0एम0शाह, जेम सिल्वरवर्ग, ओ0एम0लिंच, रोबी, दमले आदि ने जिल आदिवासियों के सामाजिक गतिशीलता का अध्ययन किया है, उनमें गोंउ़ जनजाति भी शामिल है, आदिवासियों से संबंधित कई शोधकर्ताओं ने शहडोल जिले में कार्य किया हैं, जिनमें डॉ0 के0के0शर्मा शहडोल जिले के अनुसूचित जनजातियों में सांस्कृतिक परिवर्तन, श्रीमती रचना श्रीवास्तव ने शहडोल जिले के अनुसूचित जनजाति में सामाजिक परिवर्तन, डॉ0 श्री राममित्र चतुर्वेदी ने अपने निबन्ध में आदिवासियों के सामाजिक परिवर्तन, श्रीचन्द जैन ने विंध्यप्रदेश आदिवासी गीत में इनके जीवन का वर्णन किया है उनमें सबसे ज्यादा गोंड़ जनजाति ही सम्मिलित है, इन सबके बावजूद गोंड़ जनजाति विशेष पर सूक्ष्म अध्ययन नहीं किया गया है, इसी अध्ययन के उद्देश्य से यह शोध कार्य किया जा रहा है।शहडोल जिले के सभी पॉच विकास खण्डों में गोड़ जनजाति की उल्लेखनीय जनसंख्या है इसके सामाजिक परिवर्तन के अध्ययन के लिये मुख्य आधार अधोलिखित हैः–

(अ) गोंड़ जनजाति का शहडोल जिले में अपना एक विशेष महत्व है, प्रदेश की प्रमुख जनजातियों मे जनसंख्या की दृष्टि से गोंड़ सबसे बड़ी जनजाति हैं, इसके बाद ही दूसरी अन्य जनजातियॉ आती है।

(ब) शहडोल जिले की जनजातियों पर सामाजिक एवं सांस्कृतिक परिवर्तन के नाम पर विस्तृत अध्ययन कई शोधकर्ताओं द्वारा किया गया है, सरकारी तंत्र में एकीकृत आदिवासी विकास परियोजना तथा बैगा विकास अभिकरण आज भी कार्यरत है परन्तु बहुतायत जनसंख्या के बाबजूद कोई ऐसी परियोजनायें इस जिले में कभी भी संचालित नहीं थी, जिन्हें गोंड़ विकास अभिकरण या गोड़ विकास परियोजना नाम दिया गया हो।

(स) गोंड़ जनजाति जिले की अन्य जनजातियों की अपेक्षा शिक्षित एवं सुद्वढ़ होने के बावजूद अभी भी अपने रूढ़िवादी ख्यालों अंधविश्वास तथा सैकडो वर्षा से चली आ रही सामाजिक मान्यताओं से आज भी बंधी हुई, जिससे पूरी तरह आजाद होने में अभी एक लम्बा समय लगेगा, विशेषकर महिलायें अभी भी उन बंधनों, सीमाओं एवं वर्जनाओं को पुरूष वर्ग की सहमति के बिना तोंड़ पाने की स्थिति में नहीं है।

(द) स्वतंत्रता प्राप्ति के पश्चात् समय–समय पर इस गोड़ जनजाति में क्या परिवर्तन हुये, परिवर्तन की गति क्या थी, इनके विकास में अवरोधक कौन थे, क्या इनके द्वारा उन अवरोधों को तोड़ने की कोशिश की गई, आदि का ज्ञान प्राप्त करने के लिये विषय का चुनाव द्वारा किया गया।

विधि तंत्र

कुल 50 गोंड़ परिवारों का चयन उद्धेश्यपूर्ण निद र्न विधि में किया गया है। अध्ययनकर्ता ने अपने अध्ययन की प्रकृति के अनुसार साक्षात्कार अनुसूची का निर्माण किया है इस हेतु इस विषय और क्षेत्र से सम्बन्धित अनुसूची का अध्ययन किया गया तथा कुछ गोंड़ परिवारों से प्रारंम्भिक स्तर पर व्यक्तिगत भेंट कर उनकी प्रकृति के अनुसार साक्षात्कार अनुसूची का निर्माण किया गया।

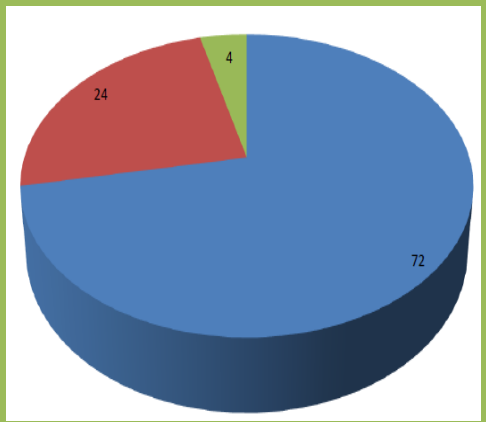
गोंड़ जनजाति–एक समाज ाास्त्रीय अध्ययन के अर्न्तगत साक्षात्कार अनुसूची का निर्माण करते समय यह वि ोष रूप से ध्यान दिया गया कि सभी को प्रतिनिधित्व प्राप्त हो सके। प्रस्तुत शोध कार्य में असहभागिक अवलोकन का प्रयोग किया गया है।

IJHEPS DIGITAL EDITION

तालिका क0 01

रुढ़िवादी एवं टोना टोटका मानने सम्बन्धी विवरण

क्र.	विवरण	संख्या	प्रतिशत
1.	हॉ	36	72.00
2.	नही	12	24.00
3.	मालूम नही	02	04.00
	योग	50	100.00



उपर्युक्त तालिका से स्पष्ट होता है कि जब उत्तरदाताओ से पूछा गया कि क्या आप रुढ़िवादी है एवं टोना टोटका मानते है तो कुल 50 उत्तरदाताओ मे से 72% ने हॉ मे जबाब दिया जिससे पता चलता है कि गोड़ जनजाति मे बहुत ज्यादा लोग रुढ़िवादी है एवं जादुई कर्म काण्डो को स्वीकार करते है। 24% उत्तरदाताओं ने नही में जबाब दिया जिससे पता चलता है कि गोड़ जनजाति में जागरुकता बढ़ रही है और वह रुढ़वादिता को छोड़ रहे है जबकि 4% ऐसे उत्तरदाताओं का है जो अ िक्षा एवं जागरुकता के अभाव के कारण मालूम नही में जबाब दिया।

तालिका क0 02

गोंड़ जनजाति में महिलाओं की स्थिति संबंधी विवरण

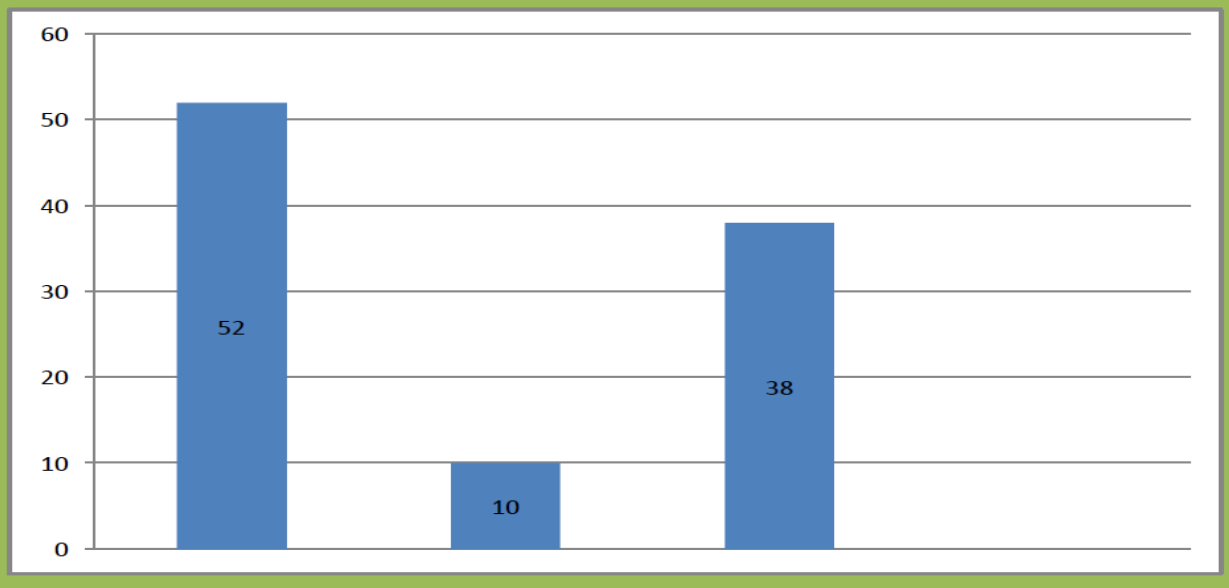
क्र.	विवरण	संख्या	प्रतिशत
1.	अच्छी	19	38.00
2.	सामान्य	11	22.00
3.	बुरी	20	40.00
	योग	50	100.00

उपर्युक्त तालिका से पता चलता है कि जब गोंड़ जनजाति के लोगों सें महिलाओं की स्थिति सम्बन्धी जानकारी चाही गई तो कुल 50 उत्तरदाकाओं मे से 38% लोंगो ने हॉ में जबाब दिया जिसका कारण उन्होने अपना पे ा नौकरी होने या पंचायतों में विभिन्न पद प्राप्त होना बताया जबकि 22% उत्तरदाताओं ने महिलाओं की स्थिति सामान्य बताया एवं 40% उत्तरदाताओं ने अभी भी महिलाओं की स्थिति खराब बताया जिससे पता चलता है कि उनमें अभी भी ि क्षा का अभाव एवं महिलाओं के प्रति अच्छी सोच का अभाव है।

तालिका क0 03

सामाजिक सांस्कृतिक परिवर्तन होने संबंधी विवरण

क0	विवरण	संख्या	प्रतिशत
1.	हॉ	26	52.00
2.	नही	05	10.00
3.	मालूम नही	19	38.00
योग		50	100.00



उपर्युक्त तालिका से पता चलता है कि जब गोंड़ जनजाति के लोगों सें सामाजिक सास्कृतिक परिवर्तन सम्बन्धी जानकारी चाही गई तो 52% उत्तरदाताओं ने परिवर्तन की बात स्वीकार करते हुए बताया है कि गोंड़ समाज में बड़ी तेजी से सामाजिक सांस्कृतिक परिवर्तन हो रहा है पूरा समाज संचरण की प्रक्रिया में भामिल है। 10% उत्तरदाताओं ने नही में जबाब दिया जो कम जागरुकता या समाज का मूल्यांकन करनें में अक्षमता को द ार्ाता है। 38% उत्तरदाताओं ने मालूम नही में जबाब देते हुए अपने आपको अध्ययन की परिधि से बाहर रखा। ाायद इसके पीछे असुरक्षाकी भावना एवं अवि वास था।

तालिका क0 04

गोंड प्राधिकरण जैसी योजनाए संचालित होने संबन्धी विवरण

क्र.	विवरण	संख्या	प्रतिशत
1.	हॉ	26	52.00
2.	नही	05	10.00
3.	मालूम नही	19	38.00
	योग	50	100.00

उपर्युक्त तालिका से पता चलता है कि जब गोंड़ जनजाति के लोगों के लिए बैगा प्राधिकरण जैसी योंजनाऍ चलने जैसी जानकारी प्राप्त करने का प्रयास किया गया तो समस्त उत्तरदाताओं में से केवल 22% उत्तरदाताओं ने हॉ में जबाब देते हुए छुट पुट अपने हित चलाई जा रही योजनाओं का उल्लेख कर केवल असंतुष्टता जाहिर की गई। जबकी 66%लोंगो ने नही में जबाब देते हुए सरकार पर गोंड़ समाज के हितों की अनदेखी करनें का आरोप लगाया गया। 12% ऐसे उत्तरदाताओं का रहा जो मालूम नही में जबाब दिया।

तालिका क0 05

जीवकोपार्जन हेतू निर्भरता संबंधी विवरण

क्र.	विवरण	संख्या	प्रतिशत
1.	वनोपज	34	52.00
2.	कृषि	06	10.00
3.	नौकरी	07	38.00
4.	व्यवसाय	03	06.00

उपर्युक्त तालिका से पता चलता है कि जब गोंड़ जनजाति के लोगों से जीवकोपार्जन के साधनों संबंधी प्र न पूछा गया तो 60 %लोंगो ने वनोपज द्वारा अपना जीवकोपार्जन बताया एवं 12% लोगो ने कृषि कार्य बताया जिससे पता लगता है कि अभी भी गोंड़ जनजाति में ज्यादातर लोग प्राथमिक व्यवसाय से ही अपना जीवकोपार्जन कर रहे है। केवल 14% लोगो ने नौकरी एवं 6% लोगो ने व्यवसाय को अपने जीवकोपार्जन का आधार बताया जिससे पता चलता है कि परिवर्तन की प्रक्रिया में यद्यपि यह बहुत कम है किन्तु भविष्य में अच्छे परिणामों की प्राप्ति की ओर इ ाारा कर रहा है।

निष्कर्ष

01. समाज में गोंड़ जनजाति के सामाजिक, सांस्कृतिक, राजनैतिक, शैक्षणिक, आर्थिक पारिवारिक परिवर्तनों का प्रभाव इनके परम्परागत जीवन पर दिखाई पड रहा हैं।
02. औद्योगीकरण, नगरीकरण एवं आधुनिकीकरण के बाद इनके विकास के साथ नई समस्याएं उभर रही हैं।
03. इस जनजाति में अत सामूहिकता के स्थान पर व्यक्तिवाद की भावना विकसित हो रही है।

04. इनके रहन–सहन प्रथाओं, संस्कारों आदि के तरीकों में भी गतिशीलता आ रही है।
05. इस जनजाति के पारिवारिक संरचना पर भी प्रभाव पड़ रहा है, जिसके कारण तनावपूर्ण संबंधों में वृद्धि, पारिवारिक कलह एवं झगड़े बढ़ रहे है।
06. बहुपत्नी विवाह का प्रचलन पहले ज्यादा था वर्तमान में कमियॉ आ रही है, परन्तु विवाह के उम्र में परिवर्तन नहीं हुआ है।
07. स्त्रियों की स्थिति अब भी निम्न बनी हुई है, स्त्री शिक्षा आज भी कम है।
08. इनका प्रमुख व्यवसाय कृषि, कृषि मजदूरी, वनोपज संग्रहण आदि है, नौकरी के प्रति आज इनका झुकाव बढ़ता जा रहा है।
09. आधुनिक वस्तुओं के उपभोग की प्रवृत्ति भी बढ़ रही है।
10. जादू–टोना भूत–प्रेत पर अभी भी इस जनजाति का विश्वास बना हुआ हैं।
11. शराब एवं अन्य नशीले पदार्थो के सेवन की प्रवृत्ति अभी भी पाई जाती है।
12. मनोरंजन के परम्परागत् साधनों के स्थान पर आधुनिक साधनों का प्रचलन बढ़ा हैं।
13. बीमारियों के उपचार की पुरानी विधियॉ अब भी प्रचलन में है, परन्तु आधुनिक सुविधाओं का लाभ प्राप्त करने का भी प्रयास किया जा रहा है।
14. दूर संचार के साधनों का बहुत तेजी से प्रचलन बढ़ा है।

सुझाव

1. सार्थक शिक्षा का प्रबंध शिक्षा किया जाना चाहिए जिससे गोंड़ जनजाति में आत्मविश्वास, अपने अधिकारों के बारे में जागरूकता तथा अन्याय से लड़ने की नैतिक शक्ति पैदा होती है।
2. गोंड़ जनजाति के शोषण एवं उत्पीड़न को रोकने के लिए आवश्यक है कि उनका चहुँमुखी विकास किया जाये। कानूनों के बारे में उनका ज्ञान बढ़ाया जाये।
3. गोंड़ जनप्रतिनिधियों को राजनैतिक व्यवस्था में अपनी भूमिका निभाने के लिए खुद को तैयार करना ही होगा, साथ ही स्थानीय लोग, सरकारी व गैर सरकारी संगठन एवं संस्थाएं मिल कर उन्हें सहयोग प्रदान करें।
4. गोंड़ जनजाति के लोगों के आर्थिक स्तर सुधारने हेतु प्रयत्न करना चाहिये इस हेतु उनकों, उनकी छोटी–छोटी भूमि में अधिक उत्पादन देने वाली उद्यानिकी योजनाओं का ज्ञान करा कर उसका प्रशिक्षण देना चाहिये।भूमि एवं कृषि सुधार हेतु विभिन्न योजनायें करना चाहिये। उनके पशुओं को उत्पादक बनाने हेतु कार्य करना चाहिये तथा वनोपज संग्रह कर उससे आय कैसे अर्जित की जाय इस हेतु प्रशिक्षण व इस दिशा में रोजगार उपलब्ध कराना चाहिये। साथ ही अन्य आयोत्पादक योजनायें संचालित करना चाहिए।

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संदर्भित सूची

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2. जैन, श्री चन्द्र : आदिवासियों के बीच में, किताबघर मेन रोड गॉधी नगर, नई दिल्ली।
3. कोल साईश्वरी –जनजातीय विकास के नवीन आयाम, एम0पी0एच0पटिलथिग कार्पोरेशन
4. पाटीदार, दिनेश ज्ञान प्रकाश डॉ0, कलेरिन, ट्राइबल रिसर्च इंन्स्टीट्यूट म0प्र0 भोपाल जनवरी 2003–04–06
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6. त्रिवेदी आर.एन. एवं शुक्ला डी.पी (1998)– रिसर्च मैथ्डोलाजी, कालेज बुक डिपो जयपुर

समाप्त

ARTICLE

21

भारत की आंतरिक सुरक्षा बनाम नक्सलवाद

डॉ. रामनिवास पटेल*, मुकेश कुमार सिंह[1]
*अतिथि विद्वान, राजनीति शास्त्र, शासकीय महाविद्यालय पवई, पन्ना
[1]शोधार्थी समाजशास्त्र, अ.प्र. सिंह विश्वविद्यालय, रीवा

सारांश

भारत की आंतरिक सुरक्षा के लिये नक्सलवाद एक चुनौती है। देश को बाहरी चुनौती आतंकवाद से तथा आंतरिक चुनौती नक्सलवाद से प्राप्त हो रही है। जिससे निपटने के लिये हमें एक कठोर रणनीति की आवश्यकता है। इसका विस्तार नेपाल सीमा से लेकर तमिलनाडु तक है जिसे 'काम्पैक्ट रिवोल्यूशनरी जोन' या 'लाल गलियारा' कहा जाता है। इससे पश्चिम बंगाल, झारखण्ड, बिहार, उड़ीसा, छत्तीसगढ़, आंध्र प्रदेश, महाराष्ट्र, मध्यप्रदेश विशेष रूप से प्रभावित है। पड़ोसी देशों से समर्थन प्राप्त इस नक्सलवाद के गंभीर परिणामों के कारण यह अब केवल राज्य के कानून व्यवस्था का मुद्दा नहीं रहा बल्कि इसने आंतरिक सुरक्षा के लिए गंभीर चुनौती भी पैदा कर दी है। पश्चिम बंगाल का लालगढ़ इसका ताजा उदाहरण है जहाँ नक्सलियों ने समानान्तर सरकार चलाना शुरू कर दिया था।

नक्सलवाद की चुनौतियों से निपटने के लिए भारत सरकार को राजनीतिक, सुरक्षात्मक और सकारात्मक सभी प्रकार के प्रयास एक साथ करने होंगे। इसके अतिरिक्त केन्द्र सरकार को राज्यों के लिए अतिरिक्तसहयोग तथा संसाधन उपलब्ध कराने होंगे। भारत सरकार देर से ही सही इन प्रयासों की ओर बढ़ रही है और उसने राज्य सरकारों को जमीनी स्तर पर नक्सलवाद की समस्या से निपटने हेतु प्रभावी कदम उठाने को प्रेरित किया है और राजय ऐसा कर भी रहे हैं। इन प्रभावी कदमों में नक्सल प्रभावित क्षेत्रों में विकासात्मक गतिविधियाँ प्रमुख रूप से शामिल हैं। इसके अंतर्गत नक्सल प्रभावित क्षेत्रों में शिक्षा का विस्तार, रोजगार के अवसरों को उपलब्ध कराना, परिवहन तंत्र का विकास, मूलभूत आवश्यकताओं की पूर्ति करीना, जन जागरूकता का प्रसार करना इत्यादि साथ ही साथ नक्सली युवकों को समाज की मुख्य धारा में शामिल करने हेतु प्रोत्साहित करना इत्यादि शामिल है। इसके उपरांत यदि नक्सली हिंसा न त्यागें तो कठोर अनुशासनात्मक कार्यवाही कर उन्हें निरूद्ध किया जाना शामिल है।

प्रस्तावना

नक्सलवाद भारत आंतरिक सिस्टम को आज इस तरह झकझोर रहे हैं कि हमारे लिए यह एक चुनौती बन गयी है कि हम इससे कैसे निपटें और देश की एकता, अखण्डता और लोकतंत्र की सुरक्षा कर सकें। यह मानव के प्रत्येक क्षेत्र को इतना प्रभावित किया है कि इससे हमारे मानव समाज का आत्मविश्वास छिन्न–भिन्न हुआ है तथा असामाजिक तत्वों को इससे बल मिला है। हमारी खूफिया एजेन्सी रॉ ने अपने एक रिपोर्ट में कहा है कि नक्सलियों की सेना में 20 हजार शस्त्र कैडर और 50 हजार से अधिक नियमित कैडर हैं। इसी बात से अंदाजा लगाया जा सकता है कि यह कितना संगठित और देश की सुरक्षा के लिए कितनी बड़ी चुनौती है। आज पुलिस को अपने ही देश के नागरिकों से युद्ध करना पड़ रहा है। नक्सलियों के कारण आंतरिक व्यवस्था में भारतीय औद्योगिक व्यवस्था भारतीय अर्थव्यवस्था, लोकतंत्र, ग्रामीण विकास, सामाजिक व्यवस्था, सांस्कृतिक व्यवस्था एवं शिक्षण व्यवस्था को खतरे में डाल रखा है। कहा जाय तो नक्सल प्रभावित राज्यों में उद्योग धंधों की इकाइयां स्थापित करना इस समय सरकार की सबसे बड़ी चुनौती है। इस्पात की सबसे बड़ी 22 परियोजनाएँ जो 82 अरब डालर की है, नक्सलियों के विरोध के कारण ये परियोजनाएँ हकीकत में तब्दील नहीं हो पा रही हैं।[1]

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सुरक्षा बलों से मुकाबला करने के लिए नक्सली हथियारों और गोला बारूद का जखीरा रखते हैं। नक्सलियों की सालाना अवैध कमाई 1400 करोड़ रूपये से ज्यादा है जिसका अधिकांश हिस्सा हथियारों की खरीदी पर खर्च किया जाता है।[2] हथियारों की कीमतों में वृद्धि के मद्देनजर नक्सलियों ने व्यापारियों और स्थानीय लोगों से ज्यादा कमीशन वसूलने लगे हैं। कभी आदिवासी अपनी लोक परम्पराओं के वैभव में जीते थे, आज खून–खराबे की कहानियों को गढ़ रहे हैं। बड़ी होशियारी से नक्सली अपना गुस्सा ग्रामीणों पर उतार रहे हैं। नक्सलियों ने अपने फोर्स सेना के सेंट्रल कमेटी, जोनल कमेटी, एरिया कमेटी, लोकल गोरिल्ला ग्राम रक्षा दल एवं जन मलेशिया जैसे निचले स्तर पर संगठन खड़े कर दिये हैं। सेंट्रल कमेटी की दो शाखाएँ होती हैं एक आपरेशन का जिम्मा सम्हालती है तो दूसरी नयी योजनाओं को बनाने के साथ मूर्त रूप देने के संबंध में अंतिम निर्णय लेती है जिससे निपटना भारतीय सुरक्षा बलों के लिये गम्भीर चुनौती बनता जा रहा है।

नक्सलवाद ने भारतीय आंतरिक सुरक्षा को निम्नलिखित रूप में खतरा पैदा किया है :–

(1) भारतीय औद्योगिक व्यवस्था को खतरा

भारत में उद्योग सार्वजनिक क्षेत्र का हो या निजी क्षेत्र का, दोनों को नक्सलियों ने खतरे में डाल रखा है। उद्योगों पर अचानक हमला, मजदूरों व वर्कारों पर हमला, उद्योग जगत को हिलाकर रख दिया है। लौह उद्योग की 22 परियोजनाएँ जो कि बड़ी परियोजनाएँ हैं जिसका बजट 82 अरब डॉलर का है, नक्सलियों की अनिच्छा और विरोध के कारण स्थापित नहीं की जा रही हैं। एक आंकड़ा झारखण्ड के खनिज लवण और धातु खनन से जुड़ी 90 परियोजनाओं की मंजूरी से संबंधित जो मिल तो चुकी है पर नसलियों के विरोध के कारण स्थापित कर पाना काफी चुनौती पूर्ण है।[3] नक्सली हिंसा से यदि सबसे ज्यादा नुकसान देखा जाय तो बंगाल के उद्योगों को हुआ है। 13 अप्रैल 2009 को उड़ीसा के कोटापुर जिले में बाक्साइड खान पर किये गये हमले में 10 जवान शहीद हो गये थे।[4]

(2) ग्रामीण विकास को खतरा

विभिन्न योजनाएँ केन्द्र एवं राज्य सरकार द्वारा चलाई जा रहे हैं जिससे गॉवों का विकास समुचित रूप से हो सके तथा ग्राम राज्य का सपना साकार हो सके, इसके लिए विभिन्न मदों से राशि स्वीकृति कर विभिन्न एजेन्सियों ग्राम पंचायत, जनपद पंचायत, जिला पंचायत, पी.डब्लू.डी., वन विभाग, शिक्षा, सिंचाई आदि विभागों द्वारा विकास कार्य को क्रियान्वित किया जा रहा है जिससे कि ग्राम का विकास संभव हो सके। विकास की गति तेज करने के लिए शासन द्वारा उद्योग लगाने हेतु उद्योग पति व शासकीय संस्थाओं को अनुदान व विभिन्न प्रकार के छूट द्वारा प्रोत्साहित किया जाता है जिससे कि वो उद्योग ग्रामीण क्षेत्रों में स्थापित कर ग्रामवासियों को नियोजित कर उनकी आर्थिक स्थिति को सुधारा जा सके। होता यह है कि योजनाओं के क्रियान्वयन से जुड़े कुछ संकुचित सोच व स्वार्थी तत्व के लोग नक्सलियों की मदद करते हैं और ग्रामीण विकास के लिए निर्धारित योजनाओं का पैसा अन्य जगह खर्च करते हैं ऐसी स्थिति में नक्सलियों को बढ़ावा एवं ग्रामीण विकास अवरूद्ध होता है। हमारे क्रियान्वयन से जुड़े लोगों पर अक्सर हमले का खतरा मंडराता रहता है। हाल ही में झारखण्ड के एक जिले के कलेक्टर का अपहरण इसका ताजा उदाहरण है।[5]

(3) भारतीय अर्थव्यवस्था को खतरा

आज नक्सलियों की बढ़ती गतिविधियों ने हमारे अर्थव्यवस्था को काफी नुकसान पहुँचाया है। एक आंकड़े के अनुसार पिछले तीन चार वर्षों से दो लाख चालीस हजार आठ सौ पन्द्रह करोड़ रूपयों का विनियोग बस्तों में ही दबा पड़ा है। देखा जाय तो भारतीय कृषि को जबरदस्त नुकसान हुआ है किसान अब नक्सली हिंसा के कारण अपने आप को भिखारी महसूस कर रहा है। भारत के उद्यमियों का फिरौती के तौर पर नक्सलियों को मोटी रकम देना पड़ता है। बिहार, झारखण्ड में धन उगाही का मामला जोरों पर चलता है। पुलिस की गिरफ्त में आये नक्सली नेता के पास से बरामद दस्तावेजों और कम्प्यूटर हार्डडिस्क से खुलासा हुआ है कि नक्सलियों ने बिहार और छत्तीसगढ़ जैसे राज्यों में फैले नेटवर्क के माध्यम से पिछले साल 1000 करोड़ रूपये की उगाही की थी। इस तरह एक साल में 1252 करोड़ रूपये जुटाने का लक्ष्य रखा है। नक्सलियों ने सड़क ठेकेदारों और तेंदूपत्ता, बांस व लकड़ी जैसे वन उत्पादों के ठेकेदारों से है। नक्सलियों ने जंगलों में शिकारियों, तस्करों और शराब का अवैध व्यापार करने वालों के साथ भी सौदेबाजी कर रखी है। नक्सली घातक हथियारों की खरीदी में ए.के.–47 राइफलों, बारूदी सुरंगों, रोकेट लॉचरों वाहन, वर्दी और दवाओं की खरीद पर 175 करोड़ रूपये खर्च किये। यह आंकड़ा 2008 का है। ये सारे कारण देश के आर्थिक विकास में बाधा बने हुये हैं।[6]

(4) भारतीय लोकतंत्र को खतरा

नक्सलवाद ने भारतीय लोकतंत्र के लिए संकट पैदा किया है, क्षेत्रीयता की समस्या राजनीति का अपराधीकरण निर्वाचन तथा प्रशासन के प्रति जनता का अविश्वास आदि में नक्सलियों की संलिप्तता है। पिछले कुछ वर्षों में नक्सलियों ने मतदान के दौरान मतदान केन्द्रों पर हमला कर एवं मतदान न करने की पब्लिक को धमकी देकर लोकतंत्र को चुनौती दे दी है।

(5) सामरिक व्यवस्था को खतरा

प्रायः हर दिन यह खबर अखबार में पढ़ने को मिलती रहती है कि हमारे सुरक्षा कर्मियों को नक्सलियों ने निशाना बनाया है और उनकी लाश बिछा दी है। सरकार ने नक्सल प्रभावित क्षेत्रों की सुरक्षा के लिए अतिरिक्त सुरक्षा बलों की तैनाती भी समय–समय पर होती रहती है किन्तु नक्सली आत्मघाती हमले कर उनकी सफलता को चुनौती देते रहते हैं। उदाहरण स्वरूप 17 जुलाई 2006 को छत्तीसगढ़ के एरा बोर शिविर पर नक्सलियों ने हमला किया जिसमें 25 लोग मारे गये और 80 व्यक्तियों का अपहरण किया गया। 16 मार्च 2007 छत्तीसगढ़ के रानी बोड़ली गाँव में पुलिस चौकी पर हमला किया जिसमें 55 पुलिसकर्मी मारे गये। 15 फरवरी 2008 नक्सलियों ने उड़ीसा के नयागढ़ शहर को घेर लिया। इसमें 14 पुलिस वाले मारे गये और पुलिस ट्रेनिंग सेंटर को भी आग लगाई। 20 जून 2009 झारखण्ड के सरंदा जंगलों में गस्त लगा रहे पुलिसवाले पर हमला किया। जिसमें 9 पुलिस वाले मारे गये। 8 अक्टूबर 2009 गढ़चिरोली जिले में नक्सलियों ने एक पुलिस दस्ते पर हमला किया जिसमें 17 पुलिस वाले मारे गये।[8]

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(6) सामाजिक व्यवस्था को खतरा

नक्सलवाद ने सामाजिक व्यवस्था को छिन्न–भिन्न कर दिया है। नक्सलवाद ने पृथकतावादी आंदोलन चला रखा है। आज नक्सली समानांतर सरकार चला रहे हैं उनके अंदर न राष्ट्र प्रेम की भावना है और न ही राष्ट्रवाद का ही महत्व है। क्योंकि यह देखा गया कि नक्सली हर उस व्यक्ति पर हमला किये जो मार्क्सवादी स्टालिनवादी और माओवादी स्वेच्छाचारी का विरोध किया। नक्सलियों द्वारा गॉवों में घुसकर महिलाओं के साथ बेखोफ बलात्कार, हत्या की गई है।

देश के प्रभावित राज्यों में से पश्चिम बंगाल के नंदी ग्राम में पूरा सन्नाटा छाया है, वहाँ बच्चे रोना भूल गये हैं और कुत्ते भौंकना। यह देखा जाय तो मरघट की शांति का दृश्य है। गुरिल्ला पार्टी का झण्डा घर पर फहराने के लिए नक्सलियों द्वारा बाध्य किया जाता है। यह देखा जा रहा है कि भारतीय समाज व्यवस्था, रहन–सहन, पारम्परिक रीति रिवाज, जीवन की मूलभूत आवश्यकताओं को अत्यधिक प्रभावित कर नक्सलवाद ने सामाजिक व्यवस्था को तहस नहस कर दिया है।

(7) शिक्षण व्यवस्थ को खतरा

नक्सल प्रभावित क्षेत्रों में नक्सलियों की हिंसक गतिविधियों के कारण वहाँ की शिक्षा व्यवस्था गंभीर रूप में बाधित हुई है। जिसके कारण प्रभावित क्षेत्रों में गॉवों के बच्चों को पढ़ाने के लिए कोई जगह उपलब्ध नहीं है। टीचर भी अपनी जान नहीं गमाना चाहते वे काफी भयभीत होते हैं और स्कूल नहीं जाते। ऐसे गॉवों के बच्चे अब शिक्षा प्राप्त करने के लिए मोहताज हैं, वे गाँव जहाँ नक्सलियों का शासन अपनी मनमानी से चल रहा है। जहाँ पहले स्कूल हुआ करते थे वहाँ आज युद्ध रणभूमि बन गये हैं। जहाँ स्कूलों में बच्चों को शिक्षा के लिए भर्ती किया जाता था वहाँ आज बच्चों को हिंसा के रास्ते पर उतारा जा रहा है। ऐसे क्षेत्र में लोगों के लिए शिक्षा के द्वार कल तो बंद ही थे आज जहाँ चहुँओर मानवीय विकास के डंके बजाए जा रहे हैं ऐसे युग में भी बंद हैं।

(8) सांस्कृतिक व्यवस्था को खतरा

नक्सलियों ने आज हमारे देश की संस्कृति को भी नुकसान पहुँचाया है क्योंकि उनके उद्देश्य की प्राथमिकता में ही यह है कि ज्यादा से ज्यादा सार्वजनिक धरोहरों को नष्ट कर ध्यान अपनी ओर खींचना होता है। नक्सलियों ने अनेक स्कूलों, कालेजों, छात्रावासों, पुलिस चौकियों को क्षति पहुँचाई है और उन्हें ध्वस्त किया है। नक्सली दबाब के चलते प्रभावित क्षेत्रों में स्कूल भवनों का निर्माण कार्य रूका हुआ है। यहाँ तक कि आवंटित राशि तक लौटा दी जाती है। हमारे रेलमार्गों, ऐतिहासिक स्थलों, स्मारकों आदि को नक्सलियों ने व्यापक नुकसान पहुँचाया है। इस तरह हमारी सांस्कृतिक व्यवस्था को नक्सलियों से खतरा पैदा हो गया है।

आज दिनोंदिन बेकारी बढ़ती जा रही है। रोजगार न मिलने के कारण तरूण नक्सलवादियों के टीम में शामिल हो रहे हैं। अध्ययन के दौरान पाया गया है कि जहाँ बेरोजगारी, गरीबी, अज्ञानता ज्यादा है वहाँ के लोग इस गतिविधि में ज्यादा संलिप्त हो रहे हैं। जहाँ सरकारी योजनाएँ नहीं पहुँच पाती वहाँ खुद नक्सली उस इलाके के लोगों की मदद करके हमदर्दी प्राप्त करते हैं और वहाँ के लोगों में नियंत्रण पाते हैं।

नक्सलवाद एवं सरकार

देश की प्रगति में सरकार को जो ऊर्जा लगानी चाहिए केन्द्र की सरकार एवं राज्य की सरकार नक्सली समस्या से निपटने में लगा रही है। समाचार चैनलों के माध्यम से पता चला है कि छत्तीसगढ़ में प्रभावित क्षेत्रों में श्रीलंका के लिट्टे माओवादियों द्वारा इन नक्सलियों को ट्रेनिंग दी जा रही है। बल्कि यहाँ तक कि आतंकवादी संगठन लश्कर–ए–तोएबा के कुछ आतंकवादी इन नक्सलियों की मीटिंग में शामिल होते हैं अर्थात् बाहरी देशों के ये माओवादी या आतंकी इन नक्सलियों तक आसानी से पहुँच रहे हैं।[9] इससे देश के सुरक्षा व्यवस्था पर प्रश्न चिन्ह खड़ा हो गया है। इससे यह साबित हो रहा है कि हमारी सुरक्षा व्यवस्था में कुछ कमियाँ अवश्य हैं। नक्सली संगठन को संचालित करने के लिए धन कहाँ से मिलता है राशन कहाँ से आता है और साथ ही यह कि पुलिस की कार्यवाही करने से पहले उसकी रणनीतियों के बारे में नक्सलियों को कैसे पता चल जाता है। सरकार को इस ओर कदम उठाने की जरूरत है कि जो लोग नक्सली गतिविधियों में भाग लेते हैं उनकी मजबूरी क्या है, ज्ञात करना होगा तथा ऐसी समस्याओं को पनपने से पहले रोकथाम कर और भी लोगों को नक्सली गतिविधियों में भाग लेने को रोका जा सके।

सराहनीय प्रयास

सरकार ने नए इंटिग्रेटेड एक्शन प्लान (आई.ए.पी.) के तहत नौ राज्यों के 78 जिलों को चिन्हित किया गया है, जिन्हें 'विकास की खाई' को पाटने के लिए हर साल 30 करोड़ का अतिरिक्त फण्ड मुहैया कराया जाएगा। 65,000 से ज्यादा छोटे–मोटे प्रोजेक्ट पहले ही चल रहे हैं। हाल ही में 'पी.सी.एस.ए.' और 'वन अधिकार अधिनियम' जैसे कुछ कानून बनाए गए हैं। प्रस्तावित जमीन अधिग्रहण व पुनर्स्थापन (एल.आर.आर.) विधेयक 2011 भी जमीन संबंधी फैसलों में स्थानीय समुदायों की ज्यादा भूमिका सुनिश्चित करेगा।[10]

नक्सलवाद और शांति वार्ता

क्रांति व मुक्ति के नाम पर वह हठधर्मिता और पागलपन को छोड़ना होगा और इसके लिए सकारात्मक उपाय की आवश्यकता है। जैसे वार्तालाप, शांतिवार्ता, समझौता आदि। मई 2006 में योजना आयोग ने डी. बंदोपाध्याय की अध्यक्षता में एक 16 सदस्यीय एक्सपर्ट ग्रुप का गठन, करके उन पर यह जिम्मेदारी सौंपी थी कि वे विकास के मुद्दों पर असंतोष, विक्षोभ व उग्रवाद के कारणों पर खोजबीन कर अपनी राय सहित रिपोर्ट सरकार को प्रस्तुत करें। एक्सपर्ट–ग्रुप के सदस्यों ने 14–15 मार्च, 2008 में जो रिपोर्ट योजना आयोग को प्रस्तुत की थी उसे अप्रैल, 2008 में अंग्रेजी में छापकर एक पुस्तिका के रूप में प्रकाशित किया गया था। इस रिपोर्ट में नक्सल प्रभावित राज्यों के आदिवासी क्षेत्रों में भूमि सुधार, पेसा कानून पर अमल, उद्योग के लिए भू–अर्जन व विस्थापन, राज्य सरकार व पुलिस का रवैया, नक्सलवाद के कारण व निदान इत्यादि विषयों पर विस्तार से विवेचना की गई है तथा अंतिम चेप्टर में समस्याओं के समाधान के लिए कई महत्वपूर्ण अनुशंसाएँ की गई हैं।[11] एन.एस.सी.एल. (आई.एम.) ने शांतिपूर्ण स्थिति का लाभ उठाकर अपनी ताकत को और मजबूत किया। इसका देश के अनेक स्थानों में अब गृहयुद्ध की स्थिति निर्मित हो चुकी है। वार्तालाप का रास्ता अवश्य खुला रखना चाहिए।

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निष्कर्ष

अतः आज नक्सली समस्या का हमारे राष्ट्रीय सुरक्षा जैसे सामाजिक, आर्थिक, लोकतांत्रिक एवं सांस्कृतिक व्यवस्था पर काफी बुरा प्रभाव पड़ा है। दिन–प्रतिदिन नक्सलियों के हौंसले बढ़ते जा रहे हैं। अब तो सुरक्षाबल खुद खतरे में है तो रोकने का प्रयास कैसे हो? अब तो नक्सलवाद का भय इतना है कि सरकार भी इसकी उपेक्षा करने लगी है। आज सरकार को एक साहस, समर्पण और समन्वित कदम उठाने की जरूरत है, राष्ट्र एक सम्पूर्ण सशक्त व्यवस्था होता है उसे इससे निष्पक्ष तरीके से लड़ने की जरूरत है।

सुझाव

(1) जनसंचार के माध्यम में रचनात्मक एवं राष्ट्रवादी शिक्षा दिया जाय तो अवश्य इसका असर उनके अंदर चेतना का विकास करेगा।

(2) जरूरत है उनकी मूल समस्या को समझने की जब हम उनकी मूल समस्या को समझ जाएंगे तब अवश्य समाधान खोज लेंगे।

(3) मूल समस्या को खत्म करना हमारी प्रथम प्राथमिकता होनी चाहिए।

(4) शांति–वार्ता को पहले महत्व देना आवश्यक होगा। इससे अच्छा तरीका कोई और नहीं हो सकता है और बाद में इसका क्रियान्वयन पूरी प्राथमिकता के साथ आवश्यक है।

(5) प्रभावित क्षेत्र के नागरिकों को नक्सली उन्मूलन में इंट्रेस्ट लेना होगा और राष्ट्र प्रेम, जन–कल्याण की भावना से कार्य करना होगा।

(6) नक्सली उन्मूलन के लिए अब सरकार के व्यापक नजरिए की जरूरत है, जिसमें सुरक्षा, विकास और राजनीतिक लामबंदी इसके लिए बेहतर हो सकता है :–

(अ) पहला रास्ता हमें पुलिस अर्द्धसैनिक बलों में स्थानीय लोगों का प्रतिनिधित्व बढ़ाना होगा, जिसके लिए अविश्वास की खाई को पाटना जरूरी है, हमें स्थानीय व आदिवासी नेटवर्क को बेहतर ढ़ंग से समझना होगा तथा इन्हें आपस में सहयोगी बनाना होगा।

(ब) दूसरा रास्ता विकास का है हमें यह सुनिश्चित करना होगा कि सड़क, स्वास्थ्य केन्द्र और स्कूल जैसी बुनियादी सुविधाएँ इन इलाकों तक पहुँच सकें। इसके लिए ज्यादा भागीदारी स्थानीय प्रशासन शासकीय सेवाओं की आपूर्ति के लिए स्थानीय लोगों की सेवाएँ लें। यह भी आवश्यक है कि स्थायी आजीविका के अवसरों का विस्तार किया जाय।

(स) तीसरा रास्ता राजनीतिक लामबंदी – प्रभावित क्षेत्र में राजनीतिक लामबंदी कर राजनीतिक जुड़ाव का माहौल तैयार करना होगा, उन्हें राज्य की राजनीति में अवसर मुहैया कराया जाय।

(7) अंत में यदि उपर्युक्त उपाय भी असफल हो जाते हैं तो अंतिम उपाय बल का प्रयोग आवश्यक होगा। हमारे राष्ट्रीय ताकत का प्रयोग कर समूल नष्ट कर दिया जाय। एक बार भय पैदा हो जाने पर पुनः नक्सली बनने की हिम्मत नहीं होगी। इस बात का जरूर ध्यान रखना पड़ेगा कि इन्हें कोई बाहरी ताकत मदद न करने पाये।

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समाप्त

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ARTICLE

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सूर्योपासना के साहित्यिक स्वरूप का ऐतिहासिक संदर्भ

खगेश नाथ गर्ग

भोध छात्र, प्रा.भा.इति.सं.एवं पुरातत्व,अ.प्र.सिं.वि.वि,रीवा

सारांश

ऋग्वेद की संहिता में सूर्य देवता के विविध रूपों के प्रतिनिधि अनेक सौर देवताओं का स्तवन हुआ है। महाकाव्यों में सूर्योपासना की अनेकवार चर्चा है, सौर सम्प्रदाय का प्रथम बार उल्लेख महाभारत में किया गया है। पुराणों में वर्णित सौर तीर्थों से सौर सम्प्रदाय की व्यापकता का ज्ञान होता है। मध्यकालीन संस्कृत कवियों ने सूर्यदेव का उल्लेख अपनी साहित्यिक कृतियों में बहुतायत से किया है।

मध्यकाल का पूर्ववर्ती काल सूर्योपासना का स्वर्णिम युग रहा है। सातवीं भादी ई.में सूर्यभक्त मयूर ने सूर्य भातक की रचना सौर सम्प्रदाय के पूर्ण प्रभाव को द ति हुये की। अनेक ऐसे सूर्य ग्रन्थ रचित हुये जो वर्तमान समय में अनुपलब्ध है। 16वीं भाती ई. का "आदित्य स्त्रोतरत्न" 17वीं भाती ई. का "सुधालहरी" व 19वीं भाती ई. का "ि वराज विजय" सूर्य उपासना के महत्वपूर्ण ग्रन्थ है।

प्रस्तावना

सूर्योपासना का प्राचीनतम साहित्यिक प्रमाण ऋग्वेद की संहिता में मिलता है जिसमें सूर्य देवता के विविध रूपों के प्रतिनिधि अनेक सौर देवताओं का स्तवन हुआ है। ऋग्वेदोत्तर वैदिक वाङमय में इन देवताओं के अतिरिक्त कुछ अभिनव और देवता भी अस्तित्व में आए है। महाकाव्यों में सूर्योपासना की अनेक बार चर्चा है। सौर सम्प्रदाय का प्रथम बार उल्लेख महाभारत में किया गया है। पुराणों में वर्णित सौर तीर्थों से सौर सम्प्रदाय की व्यापकता का ज्ञान होता है। गणेश, शक्ति, शिव, वि णु और सूर्य इन पुराण प्रसिद्ध पंच देवों में सूर्य देवता अन्यतम है। भवि य और साम्बपुराण जैसे परवर्ती पुराणों में सौर सम्प्रदाय का विस्तृत वर्णन मिलता है।

शिवमहिमा पर आधारित पुराण को सूर्य पुराण नाम देने से स्प ट है कि सौर उपासना पर ैव मत का प्रभाव पड़ा था। पौराणिक सूर्योपासना वस्तुतः वैदिक एवं उत्तर पौराणिक सूर्योपासना के बीच एक महत्वपूर्ण कड़ी सी है। पुराणों में न केवल उत्तरवर्ती सूर्योपासना की पद्धति में प्राप्त परिवर्तनों के बीच सन्निहित है, सूर्य देवता के स्वरूप से संबंध कई परवर्ती अवधारणाओं का अंकुरण भी यही हुआ है।

मध्यकालीन संस्कृत कवियों ने सूर्यदेव का उल्लेख अपनी साहित्यिक कृतियों में बहुतायत से किया है। कवि कुल चूड़ामणि कालिदास ने देवी पार्वती को पंचाग्नि तप करते हुये कुमार सम्भव नामक काव्य–ग्रन्थ में वर्णित किया है जिनके चारों ओर लौकिक अग्नि प्रज्वलित थी और ऊपर आकाश में सूर्याग्नि तप रही थी। जिससे देवी पार्वती का मुख तप कर लाल हो गया था।[1] उन्हीं कालिदास के ग्रन्थ विक्रमो शीयम् में कई बार सूर्यदेव की आराधना की गई है।

रघुवंश महाकाव्य में कालिदास ने अरूण का वर्णन किया है जो अंधकार का नाश करते है उसी ग्रन्थ में विश्वकर्मा को सूर्यदेव की नराकार मूर्ति गढ़ते हुये वर्णित किया गया है।[2] यह भी वर्णन है कि सूर्यदेव की एक किरण अमृत नाम की चराचर की प्राणदात्री है। तथा सूर्यदेव भक्तों के पापों का क्षय करते है एवं संसार के अंधकार को भी न ट करते है।

राजा ह र्षवर्धन का पिता प्रभाकर वर्धन सूर्यदेव का परम भक्त था। वह वेत रेशमी वस्त्र धारण कर पूर्वाभिमुख होकर हाथ जोड़कर घुटनों के बल बैठकर भूमि पर मस्तक नवाकर सूर्यदेव की आराधना करता था। सम्पूर्ण पूजन सामग्री से पूजन कर सूर्य की परिक्रमा कर खड़े होकर आदित्य हृदय स्त्रोत का ातशः पाठ करता था।[3]

इस प्रकार खुले आकाश में इ ट सूर्यदेव की पूजा की प्रथा वैदिक आर्यों के समय से ही प्रचलित थी मिश्र देश में भी इसी से मिलती जुलती सूर्य पूजन की प्रथा थी। सोमदेव कृत कथा सरित् सागर में भी सूर्यदेव का वर्णन आदर पूर्वक वर्णित है। नै धचरितम् के लेखक श्री ह ि ने ाकद्वीप के समीप लक्षद्वीप का वर्णन किया है, जहां सौर सम्प्ररदाय के लोग निवास करते थे, जो सूर्यदेव का पूजन करते थे।

भवभूति ने अपने ग्रन्थ मालती माधव के नन्दीपाठ में सूर्यदेव की वन्दना की है। वेणी संहार के लेखक भट्टनारायण ने सूर्यदेव के उदय रूप को अर्ध्य देने का वर्णन किया है। कथासरित्सागर में भी सूर्य की वन्दना की गई है। सूर्य को वीरों के पितृतुल्य कहा गया है तथा त्व टा, भग, अर्यमन, पू ान आदि नामों को वीरों का पिता कहा गया है देवों तथा असुरों के मध्य युद्ध में सूर्यदेव को देवों का सहायक कहा गया है। भगवान गणेश को गणों के अध्यक्ष के रूप में सूर्य की वन्दना करते हुये लिखा गया है सूर्य के सप्ताश्व रथ का भी वर्णन है।

समस्त पुराणों में सूर्यपूजा का वर्णन विस्तार से किया गया है। साम्ब पुराण, लिंग पुराण, वि णुपुराण, पद्म पुराण आदि को सूर्य पुराण कहा जाए तो कोई प्रत्युक्ति नहीं होगी।

छठी ाताब्दी के विद्वान वराहमिहिर[4] ने वृहत्संहिता नामक ग्रंथ की रचना की है जिसमें उन्होंने मग पुजारियों का वर्णन करते हुये सूर्य देव की प्रतिमा किस प्रकार निर्मित की जावे इसका भी वर्णन किया है। ुक्र नीतिशास्त्र में भी सूर्य प्रतिमा के निर्माण के संदर्भ में विद्वतापूर्ण वर्णन किया गया है।

कश्मीर के विद्वान ने राजतंरगिणी की रचना की है उसमें ललितादित्य मुक्तापीठ द्वारा बनवाया हुआ प्रख्यात मार्तण्ड मंदिर का उल्लेख है जिसके भग्नावशे ा वर्तमान समय में भी दृ टगोचर होते है। सुप्रसिद्ध भक्त कवि मयूर भट्ट[5] ने सूर्य ातकम् नामक ग्रन्थ सूर्यदेव पर लिखा है, जो 100 छन्दों में है। इसमें भक्तिपूर्वक सूर्यदेव की वन्दना की है। यह ग्रन्थ संस्कृत साहित्य की अमूल्य निधि है इसकी रचना से कवि मयूर भट्ट का कु ठ रोग ठीक हो गया था। सुप्रसिद्ध विद्वान अमर सिंह ने अमर को ा में सूर्यदेव के 31 नाम लिखे है जिनके नित्य पाठ से भक्ति भावना का संचार होता है।

वर्तमान काल में सौर सम्प्रदाय की उपासना का एक प्रमुख ग्रन्थ सूर्य–तंत्र–साधना[6] है। इसमें सूर्य नारायण की पूजा विधि बताकर सौर पुराण से एक सौर स्तोत्र, ब्रह्मयामल से त्रैलोक मंगल कवच, बाल्मीकि रामायण से सुप्रसिद्ध आदित्य हृदय स्तोत्र, ुक्ल यजुर्वेद से विभ्राटपद से प्रारम्भ होने वाला सूक्त, महाभारत के वन पर्व से सूर्योत्तरशतनाम स्तोत्र एवं भवि य पुराण के सप्तमी कल्प से सूर्य सहस्त्रनाम दिये गये है। यह ग्रन्थ सौर सम्प्रदाय के नि ठ भक्त जनों के लिये परम उपादेय है।

आदित्य हृदय स्त्रोत दो हैं–प्रथम तो बाल्मीकि रामायण में वर्णित अगस्त्य ऋि ा द्वारा श्रीराम को दिया हुआ और दूसरा आदित्य हृदय स्तोत्र 178 लोकों का जिसे श्रीकृ ण ने महाभारत युद्ध के पश्चात अर्जुन को दिया था। ये दोनों आदित्य हृदय स्तोत्र इस ग्रन्थ में है।

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सूर्यदेव संबंधी लुप्त साहित्य

मार्तण्ड पुराण का वर्णन भवि योत्तर पुराण में है, किन्तु आज यह अनुपलब्ध है। आदित्य पुराण का वर्णन अलबरूनी ने पुराणों की सूची में किया है स्कन्द पुराण एवं मत्स्य पुराण में भी इसका उल्लेख है किन्तु अब यह उपलब्ध नहीं है। देवी भागवत् पुराण एवं वृहत धर्म पुराण में भी इसका उल्लेख प्राप्त होता है, अलबरूनी ने इसके कुछ लोकों का अनुवाद किया है।

सूर्यदेव के संबंध में भास्कराह उपपुराण भी था जो कि वर्तमान समय में प्राप्त नहीं होता। सौर पुराण मुख्य रूप से शिव पूजा पर आधारित है डॉ. हाजरा का मत है कि सूर्यदेव की प्रधान पूजा के सम्बन्ध में सौर पुराण रहा होगा जो कि अब उपलब्ध नहीं है।

काल निर्णय में चर्चित उत्तर सौर पुराण और भवि य पुराण में वर्णित सौर धर्म उप पुराण मध्यकाल में थे। किन्तु अब नहीं मिलते।

मध्यकाल का पूर्ववर्ती काल सूर्योपासना का स्वर्णिम युग रहा है। सम्भवतः यही भवि य, स्कन्द ब्रह्म, वाराह वि णुधर्मोत्तर, साम्ब आदि पुराणों का प्रणयत काल था। इन पुराणों से सूर्य के अनेकानेक स्त्रोतों की प्राप्ति होती है। मयूर, भवभूति, अमरसिंह, ांकराचार्य, आनन्दगिरि आदि की साहित्यिक कृतियों की रचना का काल भी यही पूर्ववर्ती मध्यकाल है। सातवी ाती ई. में सूर्यभक्त मयूर ने सूर्य ातक की सौर सम्प्रदाय के पूर्ण प्रभाव को दर्शाते हुये की, ह ावर्धन के राज्यकाल में सूर्योपासना अपनी चरम सीमा पर थी। इस काल में सौर सम्प्रदाय अन्य धार्मिक सम्प्रदायों की अपेक्षा अधिक उत्क ि पर था।

भौगोलिक दृ ि टकोण से भारत में सूर्योपासना व्यापक रही। मुल्तान, मथुरा, कोणार्क, कश्मीर, उज्जयिनी, मोधेर आदि सूर्योपासकों के प्रसिद्ध केन्द्र थे। सूर्य भक्तों द्वारा संस्कृत में सूर्यस्त्रोतों का प्रणयन भी समय–समय पर होता रहा है।

16वीं ाती ई. के कवि अप्पय दीक्षित का 'आदित्यस्तोत्ररत्न' नामक सूर्यस्त्रोत महत्वपूर्ण है। 17वीं ाती. ई. में पण्डितराज जगन्नाथ ने 'सुधालहरी' नामक सूर्यपरक स्तोत्रकाव्य एवं 19वीं ाती ई. के गद्यलेखक अम्बिकादत्त व्यास ने अपने गद्य काव्य 'शिवराजविजय' की प्रस्तावना में सूर्यवन्दना का वर्णन कर प्राचीनकाल से वर्तमान काल तक के सूर्योपासना की रोचकता को प्रकट किया है। निश्चय ही सूर्यदेव ने प्राचीन काल से लेकर आज तक भारतीय देवमण्डल में विशे ा सम्मान प्राप्त किया है।

संदर्भित सूची

1. कुमार सम्भव, सर्ग 5 एवं रघुवं ाम् सर्ग 14 भलोक 66
2. रघुवं ाम् सर्ग 5, भलोक 71
3. रघुवं ाम्, सर्ग 5 भलोक 62
4. उज्जयिनी के भाकरि विक्रमादित्य के दरबारी ज्योतिश के प्रकाण्ड विद्वान।
5. कवि बाण के साले एवं भूशण भट्ट के मातुल थे।
6. मृत्युंजय महाबोध, सूर्य तंत्र साधना, मनोज पाकेट, बुक्स दिल्ली।

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समाप्त

ARTICLE

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कोयला खान के कर्मचारियों की क्षमता संवर्धन सुविधाओं का अध्ययन (जोहिला क्षेत्र एस.ई.सी.एल. के संदर्भ में)

डॉ. ऋतुराज गौतम
अतिथि विद्वान, वाणिज्य, शहडोल

सारांश

निर्माणी संस्था के उत्पादन में भूमि, श्रम, पूँजी, संगठन व साहस मुख्य घटक होते हैं किन्तु मानवीय शक्ति, कौशल और ज्ञान के बिना सभी प्राकृतिक संसाधनों का दोहन संभव नहीं है। जिस संस्था के कर्मचारी/श्रमिक वर्ग जितने अधिक संतुष्ट होंगे उस संस्था का उत्पादन उतना अधिक होगा तथा लाभ में भी वृद्धि होती है। जोहिला क्षेत्र के चार उपक्षेत्र, उमरिया, पाली, नौरोजाबाद तथा पिनौरा–विंध्या के 30–30 कर्मचारियों का चयन दैव निदर्शन पद्धति से किया गया है। प्रश्नावलियों से प्राप्त उत्तर में पाया गया कि कोयला खान कर्मचारियों को प्रत्यक्ष मजदूरी के साथ आनुषंगिक लाभ, श्रम–कल्याण व भत्ते की सुविधाएँ दी जाती हैं। जैसे आवासीय, चिकित्सकीय, सवैतनिक अवकाश, सवैतनिक त्यौहार अवकाश, बिजली, ईधन, खदान का स्वच्छ वातावरण, शुद्ध पेय जल, सुरक्षात्मक, मनोरंजन, मंहगाई भत्ता, रात्रि पाली भत्ता एवं भूमिगत भत्ता आदि की पर्याप्त सुविधाएं प्राप्त होने से कर्मचारियों में संतुष्टि प्राप्त हुई है तथा कोयला उत्पादन में भी औसतन वृद्धि हुई है ।

प्रस्तावना

उत्पादन के घटक में भूमि, श्रम, पूँजी, संगठन, व साहस शामिल हैं। मानवीय शक्ति, कौशल और ज्ञान के बिना समस्त प्राकृतिक संसाधन निष्क्रिय हो जाते हैं यदि उत्पादन करने वाले श्रमिक वर्ग के मौद्रिक भुगतान के साथ–साथ सुविधाएँ दिये जाने से श्रमिकों में अधिक संतुष्टि प्राप्त होने से उत्पादन बढ़ता है तथा उत्पादन लागत में कमी आती है । (अग्रवाल 1971)

किसी उद्योग में कर्मचारियों को उनके प्रत्यक्ष वेतन के अतिरिक्त दिये जाने वाले लाभ को आनुषंगिक लाभ कहा जाता है। इसमें बीमा, छुट्टियाँ, पेंशन लाभ आदि शामिल किये जाते हैं। एक अध्ययन के अनुसार किसी भी संस्थान की कुल श्रम लागत का एक तिहाई हिस्सा आनुषंगिक लाभों की लागत होती है। (शर्मा 2007)

श्रम–कल्याण कार्य का आशय ऐसी सेवाओं व सुविधाओं से है जो कारखाने में या उसके निकट उपलब्ध हो, जिससे कि कारखाने में कार्य करने वाले श्रमिक स्वस्थ्य और शांतिपूर्ण परिस्थितियों में अपना कार्य कर सकें तथा अपने स्वास्थ्य व नैतिक स्तर को ऊँचा रख सकें। (सक्सेना 1988)

श्रम पर शाही आयोग ने आवास, स्वच्छता तथा चिकित्सा संबंधी सुविधाओं का वर्णन करते हुए स्पष्ट किया है कि ''ये सुविधाएँ सामान्यतः श्रमिक स्वयं नहीं जुटा पाता, अतः इन्हें श्रम–कल्याण के अंतर्गत उपलब्ध कराना चाहिए।'' श्रम–कल्याण सेवाओं का विस्तार एक विनियोग है क्योंकि इसकी वृद्धि से श्रमिक की कार्यकुशलता में वृद्धि होने से लाभ में वृद्धि होती है।

रीगे समिति (श्रम अनुसंधान समिति 1946) ने श्रम–कल्याण कार्यों का क्षेत्र बहुत व्यापक बताया है। इनमें वे सब क्रियाएँ सम्मिलित की जाती हैं जो श्रमिकों के बौद्धिक, नैतिक तथा आर्थिक कल्याण से संबंधित हैं। चाहे ये सुविधाएँ नियोक्ताओं, सरकार व अन्य संस्थाओं द्वारा उपलब्ध की गई हो ।

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इस प्रकार श्रम–कल्याण के अन्तर्गत आवास, चिकित्सा, शिक्षा, स्वास्थ्य, मनोरंजन, बच्चों की शिक्षा, शिशु–गृह, सवैतनिक अवकाश, विशेष बीमा सुविधाएँ सम्मिलित की जाती हैं। (मामोरिया 2011)

प्रत्येक व्यावसायिक संस्था का उद्देश्य होता है कि वह अपने कुशल प्रबन्धन से उचित लाभ प्राप्त कर व्यवसाय के स्वामी को उचित दर से पूँजी पर प्रत्याय प्रदान करें, कर्मचारियों को संतुष्ट रखें तथा सामाजिक दायित्व को पूरा कर सकें। जिस संस्था में श्रम–कल्याण से संबंधित सुविधाएँ जितनी अधिक होगी उस संस्था के कर्मचारियों में संतुष्टि उतनी अधिक होने से न्यूनतम लागत पर अधिकतम उत्पादन होने से लाभ अधिक होता है। (पंडित, 2011)

व्यावसायिक संस्थान की सफलता मापनें का सबसे बड़ा पैमाना तो उसका आर्थिक लाभ ही होता है किन्तु यह एक मात्र उद्देश्य नहीं है। उत्पादन में लगे श्रमिकों की संतुष्टि भी आवश्यक है जिसके लिए श्रमिकों को श्रम–कल्याण की सुविधाएँ व भत्ते आदि दी जानी चाहिए, जिससे उत्पादन वृद्धि होने से लाभ में वृद्धि हो जाती है । (भास्कर–लक्ष्य 2011)

उद्देश्य :–जोहिला क्षेत्र की कोयला खानों में कार्यरत कर्मचारियों को प्राप्त सुविधाओं का उत्पादन क्षमता पर पड़ने वाले प्रभाव का अध्ययन करना ।

चर :– प्रस्तुत शोध–पत्र में निम्नलिखित चरों को लिया गया है –

स्वतंत्र चर :–आवासीय, चिकित्सीय, शिक्षा, पानी, बिजली, सवैतनिक अवकाश, बाल–उद्यान आदि ।

परतंत्र चर :–कोल कंपनी द्वारा दी गई सुविधाओं से कर्मचारियों की उत्पादन क्षमता पर प्रभाव ।

उपकरण :–प्रस्तुत शोध कार्य में प्राथमिक एवं द्वितीयक दोनों प्रकार के समंकों का प्रयोग किया गया है। प्राथमिक समंको को एकत्रित करने के लिए शोधकर्ता द्वारा स्वनिर्मित प्रश्नावली का प्रयोग किया गया है ।

शोध प्रविधि :–उत्पादन क्षमता में वृद्धि के लिए दी जाने वाली सुविधाएँ जैसे आवास, चिकित्सा, शिक्षा, बिजली, पानी, नाली, सवैतनिक अवकाश आदि से संबंधित प्रश्नावली तैयार की गई है, जिसके लिए 4 उपक्षेत्र के 30–30 कर्मचारियों का चयन न्यादर्श प्रणाली से किया गया तथा प्रश्नावली से प्रश्नों के उत्तर प्राप्त किये गये। प्राप्तांकों के आधार पर मास्टर सीट तैयार किया गया है, इसके पश्चात् सांख्यकीय विश्लेषण करके निष्कर्ष निकाला गया है ।

सीमांकन :– प्रस्तुत शोध कार्य में केवल जोहिला क्षेत्र के 4 उपक्षेत्र पाली, नौरोजाबाद, उमरिया तथा विन्ध्या–पिनौरा कोयला खान के कर्मचारियों का चयन किया गया है ।

परिकल्पना :–प्रस्तुत शोध–पत्र में निम्नलिखित परिकल्पनाएँ की गयी है :–
1.जोहिला क्षेत्र कोयला खानों में उत्पादन क्षमता में वृद्धि के लिए पर्याप्त सुविधाएँ हैं।
2.जोहिला क्षेत्र की कोयला खानों में दी जा रही सुविधाओं से कर्मचारियों में संतुष्टि है।
3.जोहिला क्षेत्र की कोयला खानों के उत्पादन में औसतन वृद्धि हुई है।

तथ्यों एवं परिणामों का विश्लेषण ।

जोहिला क्षेत्र की कोयला खानों में उत्पादन क्षमता संबंधी सुविधाएँ :–
कर्मचारियों की उत्पादन क्षमता में वृद्धि के लिए निम्न लिखित सुविधाएँ दी जाती हैं ।
1. आनुषंगिक लाभ की सुविधाएँ
2. कर्मचारी/श्रम–कल्याण की सुविधाएँ
3. भत्ते

(1) आनुषंगिक लाभ की सुविधाएँ :–
कोल कंपनी द्वारा अपने कर्मचारियों को वेतन के अतिरिक्त सुविधाएँ और लाभ दिये जाते हैं, उनको दी गयी सुविधाओं का मुद्रा में जितना मूल्यांकन होता है, आनुषंगिक लाभ कहलाता है। कर्मचारियों को निम्न आनुषंगिक लाभ की सुविधाएँ दी जाती हैं ।

1. आवासीय सुविधा :– जोहिला क्षेत्र की कोयला खान कंपनी द्वारा कार्यरत कर्मचारियों व अधिकारियों को आवासीय सुविधा कम्पनी द्वारा निर्मित आवासीय कालोनियों में मकान का आबंटन, आबंटन समिति द्वारा नियमानुसार किया जाता है। इस क्षेत्र में कुल आवासों की संख्या 4412 है।

2. चिकित्सीय सुविधा :– कर्मचारियों के शारीरिक व मानसिक स्वस्थता एवं उनके द्वारा किये गये कार्यों में चोली–दामन का संबंध होता है अतः कोल कंपनी द्वारा कार्यरत कर्मचारियों एवं उनके परिवार का स्वास्थ्य अच्छा रह सके तथा दुर्घटना आदि के लिए प्रत्येक खदान पर स्वास्थ्य केन्द्र की स्थापना की गयी है जिसमें प्राथमिक चिकित्सा दी जाती है। प्रत्येक खदान पर एम्बूलेन्स की सुविधा भी है जो बीमारी एवं आकस्मिक दुर्घटना की दशा में मुख्य चिकित्सालय नौरोजाबाद में भर्ती कराने में उपयोग में आती है।

3. कर्मचारी के बीमार होने पर चिकित्सीय अवकाश की सुविधा :– सामान्यतः सभी कोल कंपनी के कर्मचारियों को 15 दिनों का सवैतनिक बीमारी अवकाश दिया जा सकता है। कर्मचारी द्वारा चिकित्सीय अवकाश न लेने पर अधिकतम 60 दिनों तक चिकित्सीय अवकाश को एकत्र किया जा सकता है ।

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4. कर्मचारियों के बच्चों को शिक्षा की सुविधा :– जोहिला क्षेत्र के कोयला प्रबन्धन द्वारा कर्मचारियों के बच्चों को शिक्षा की सुविधा दी जाती है जिसके परिणाम स्वरूप कर्मचारियों को अपने बच्चों की शिक्षा के दायित्व से मुक्ति मिल जाती है और अपने कार्य को अच्छी तरह से मन लगाकर करते हैं जिससे उत्पादन क्षमता में वृद्धि होती है।

5. सवैतनिक त्यौहार अवकाश की सुविधा :–कोल कंपनी द्वारा अपने कर्मचारियों को 8 सवैतनिक त्यौहार अवकाश दिये जाते हैं। गणतंत्र दिवस, खनिज दिवस, स्वतंत्रता दिवस एवं महात्मा गांधी जयंती इन 4 दिनों की अनुमति बिना किसी विकल्प के रहेगी तथा शेष 4 दिन अनुबंध के द्वारा निश्चित किया जाता है। कर्मचारी इन 8 दिनों में से किसी भी दिन कार्य पर उपस्थित होता है तो उसे 3 गुना वेतन या 2 गुना वेतन और उसी कैलेण्डर वर्ष के दौरान किसी भी दिन सवैतनिक 1 दिन का अवकाश प्राप्त करने का विकल्प रहता है ।

6. बिजली की सुविधा :–कंपनी द्वारा प्रत्येक कर्मचारी को आबंटित प्रत्येक आवास को 30 किलोवाट प्रति आवास मुफ्त बिजली दी जाती है ।

7. ईंधन की सुविधा :– कोल कंपनी के प्रत्येक कर्मचारी को 14.5 कि0ग्रा0 प्रति माह एल0पी0जी0 सिलेण्डर की सुविधा दी जाती है ।

(2) कर्मचारी/श्रम–कल्याण संबंधी सुविधाएँ :–
कर्मचारी/श्रम–कल्याण संबंधी सुविधाएँ निम्नलिखित सुविधाएँ दी जाती हैं :–
1. खदान का स्वच्छ वातावरण :– जोहिला क्षेत्र की सभी भूमिगत खानों में शुद्ध हवा के लिए पंखों की व्यवस्था है। सफाई के लिए सफाई कर्मचारी हैं। इस तरह से स्वच्छ वातावरण के लिए उचित प्रबंध किया गया है जिससे कर्मचारियों में उत्पादन क्षमता का ह्रास न हो ।
2. शुद्ध पेय जल की सुविधा :– जोहिला क्षेत्र की सभी खानों के ऊपर खानों के अन्दर तथा आवासीय कालोनियों में शुद्ध पेयजल की व्यवस्था है। शुद्ध पेय जल हेतु एकत्रित जल को शुद्धीकरण यंत्र से शुद्ध करके आपूर्ति की जाती है जिससे दूषित पानी से होने वाली बीमारियां नहीं होती हैं और कर्मचारियों की उत्पादन क्षमता बनी रहती है।
3. जल पान गृह की सुविधा :– इस क्षेत्र में कर्मचारियों के लिए केवल 2 ही जल पान गृह हैं। इनमें कर्मचारियों को भोजन, नाश्ता व चाय आदि रियायती दर पर उपलब्ध रहता है ।
4. कार्य का समय :– कारखाना अधिनियम 1984 की धारा 51 के अनुसार किसी भी श्रमिक से 1 सप्ताह में 48 घण्टे से अधिक कार्य नही लिया जा सकता है तथा सप्ताह में 1 दिन का विश्राम दिया जाता है जिससे श्रमिक व कर्मचारियों की क्षमता में कोई कमी नहीं आती है ।
5. सुरक्षात्मक सुविधा :– कोल कंपनी अपने सभी स्तर के कर्मचारियों की सुरक्षा हेतु प्रशिक्षण देकर सुरक्षा सामग्री उपलब्ध कराता है जैसे सिर की सुरक्षा हेतु हेलमेट, पैरों की सुरक्षा हेतु लॉगबूट, धूल के कणों के लिए मास्क आदि ।

6. मनोरंजन की सुविधा आदि :– कर्मचारियों एवं उनके बच्चों के मनोरंजन हेतु चारों उपक्षेत्रों में खेल का मैदान, क्लब, बाल उद्यान, स्टेडियम आदि की सुविधाएँ प्रदान की जाती हैं ।

(3) भत्तों की सुविधा

इस क्षेत्र में कोल कंपनी लिमिटेड द्वारा अपने कर्मचारियों की उत्पादन क्षमता में वृद्धि के लिए मूल वेतन के अतिरिक्त मुद्रा में निम्न भत्तों का भुगतान किया जाता है–

1. विशेष मंहगाई भत्ता
2. परिवर्तनशील मंहगाई भत्ता
3. रात्रि पाली भत्ता
4. मकान किराया भत्ता
5. यूनिफार्म धुलाई भत्ता
6. वाहन भत्ता
7. भूमिगत भत्ता आदि

सारणी क्र0–1

जोहिला क्षेत्र की कोयला खान कम्पनी द्वारा दी गयी सुविधाएँ उत्पादन क्षमता में वृद्धि के लिए पर्याप्त या अपर्याप्त के संबंध में कर्मचारियों से प्राप्त परिणाम का विवरण –

क्र0	विवरण	हॉ		नहीं	
		कर्मचारियों की संख्या	% में	कर्मचारियों की संख्या	% में
1	आनुषंगिक लाभ की सुविधाएँ	109	90.83	11	9.17
2	कर्मचारी/श्रम–कल्याण की सुविधाएँ	107	89.17	13	10.83
3	भत्तों की सुविधाएँ	111	92.5	9	7.5
	योग –	**327**	–	**33**	–
	औसत/समान्तर माध्य	109	90.83	11	9.17

स्रोत – सर्वेक्षण से प्राप्त आंकड़े

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सारणी क्र0 1 के अध्ययन से स्पष्ट है कि जोहिला क्षेत्र की कोयला खान कंपनी द्वारा प्रदत्त सुविधाएँ उत्पादन क्षमता में वृद्धि के लिए पर्याप्त या अपर्याप्त हैं, आनुषंगिक लाभ की सुविधाओं के संबंध में कुल 120 कर्मचारियों में 109 (90.83%) हॉ तथा 11 (9.17%) ने नहीं में उत्तर दिया। कर्मचारी/श्रम–कल्याण की सुविधा के संबंध में 107 (89.17%) हॉ तथा 13 (10.83%) नहीं में जबाव दिया। भत्तों की सुविधा के संबंध में 111 (92.5%) हॉ तथा 9 (7.5%) नहीं में उत्तर दिया। औसत 109 (90.83%) कर्मचारियों ने प्राप्त सुविधाओं को पर्याप्त तथा 11 (9.17%) अपर्याप्त बताया। जिससे यह निष्कर्ष निकलता है कि कोयला कंपनी द्वारा वर्तमान में दी जाने वाली सुविधाएँ उत्पादन क्षमता में वृद्धि के लिए पर्याप्त हैं ।

सारणी क्र0–2

जोहिला क्षेत्र की कोयला खानों में दी जा रही सुविधाओं से कर्मचारियों में संतुष्टि एवं असंतुष्टि संबंधी परिणाम का विवरण –

क्र0	उपक्षेत्र का नाम	संतुष्टि		असंतुष्टि		कर्मचारियों का योग
		कर्मचारियों की संख्या	% में	कर्मचारियों की संख्या	% में	
1	उमरिया	28	33.33	2	6.67	30
2	पाली	26	86.67	4	13.33	30
3	नौरोजाबाद	26	86.67	4	13.33	30
4	पिनौरा–विन्ध्या	27	90.00	3	10.00	30
	योग –	**107**	–	**13**	–	**120**
	औसत/समान्तर माध्य	26.75	89.17	3.25	10.83	30

स्रोत – सर्वेक्षण से प्राप्त आंकड़े

उपरोक्त सारणी के अध्ययन से स्पष्ट है कि जोहिला क्षेत्र की कोयला खानों में दी जाने वाली सुविधाओं से उमरिया उपक्षेत्र के 30 कर्मचारियों में से 28 (93.33%) संतुष्टि तथा 2 (6.67%) असंतुष्टि के रूप में जवाब दिया। पाली व नौरोजाबाद उपक्षेत्र के 30 कर्मचारियों में से 26 (86.67%) संतुष्टि तथा 4 (13.33%) असंतुष्टि व्यक्त किया। पिनौरा–विन्ध्या उपक्षेत्र के 30 कर्मचारियों 27 (90%) संतुष्टि तथा 3 (10%) असंतुष्टि में उत्तर दिया। कुल कर्मचारियों में औसत 26.75 (89.17%) संतुष्टि व 3.25 (10.83%) असंतुष्ट हैं जिसके फलस्वरूप यह निष्कर्ष निकलता है कि अधिकांशतः लगभग 98% कर्मचारियों संतुष्ट हैं ।

सारणी क्र0–3

जोहिला क्षेत्र की कोयला खानों का उत्पादन उपक्षेत्र व वर्ष के आधार पर वर्ष 2007–08 से वर्ष 2011–12 तक

(मिलियन टन में)

क्र0	उपक्षेत्र का नाम	वर्ष				
		2007–08	2008–09	2009–10	2010–11	2011–12
1	उमरिया	3,46,000	2,82,440	3,14,435	2,77,075	3,07,430
2	पाली	2,97,825	3,39,000	3,69,870	3,62,600	2,87,275
3	नौरोजाबाद	4,29,920	3,89,170	4,05,795	4,21,220	4,07,700
4	पिनौरा–विन्ध्या	5,60,555	5,98,755	8,85,210	9,86,075	9,60,410
	योग –	**16,34,300**	**16,09,365**	**19,75,310**	**20,46,970**	**18,32,615**

उपरोक्त सारणी के अध्ययन से स्पष्ट है कि पाली, पिनौरा–विन्ध्या तथा नौरोजाबाद उपक्षेत्रों के उत्पादन में औसतन वृद्धि हुई है किन्तु उमरिया उपक्षेत्र में उतनी वृद्धि नहीं हुई। इसका कारण पूछने पर बताया गया कि खान के मुहॉन से कोयला उत्पादन का स्थान लगभग 4 कि0मी0 दूरी होने से अधिक समय लगता है। कुल उत्पादन में वर्ष 2011–12 को छोड़ कर अन्य सभी वर्षों में वृद्धि दर्ज की गयी अतः यह निष्कर्ष निकलता है कि इस क्षेत्र की कोयला खानों के उत्पादन में वृद्धि हुई है।

परिकल्पना का सत्यापन

1. जोहिला क्षेत्र कोयला खानों में उत्पादन क्षमता में वृद्धि के लिए पर्याप्त सुविधाएँ हैं। यह परिकल्पना सत्य है। (सरणी क्र0–1 से)
2. जोहिला क्षेत्र की कोयला खानों में दी जा रही सुविधाओं से कर्मचारियों में संतुष्टि है। यह परिकल्पना सत्य है। (सरणी क्र0–2 से)
3. जोहिला क्षेत्र की कोयला खानों के उत्पादन में औसतन वृद्धि हुई है। यह परिकल्पना सत्य है। (सरणी क्र0–3 से)

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