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REVIEW STUDY ON SUPPORT TO HOME SCIENCE FROM TEXTILE INDUSTRY WITH RESPONSE TO BEHAVIOURAL SCIENCE

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ABSTRACT
Materials comprise a big piece of individuals regular day to day existence. Earthy people have been calling forward businesses to fuse supportability standards into their creation measures. In correlation with different enterprises, material industry is assumed of to be significant benefactor towards ecological contamination and is susceptible to making different environmental (water body contamination, squander age, air contamination) issues during flexibly chain from fiber creation till texture wrapping up. This paper surveys the present writing identified with different supportability issues encompassing the fabric business over the globe. The creators order the writing to look at the drivers, obstructions, and reactions of firms within the material business for maintainability. no matter a developing group of examination around there, we distinguish critical holes within the writing with unique regard to administrative approaches being utilized for joining supportability. While it's imperative to comprehend the inspirations that drive firms towards supportability and limits to usage, consideration is likewise drawn towards research viewpoints concerning administrative discernment towards new advancements and cycles. The article likewise gives future research openings in sort of explicit inquiries to fortify existing writing during this field.

Keywords: Sustainability issues, Textile industry ,Textile value chain, Sustainability strategies, Drivers and barriers, Strategic response

INTRODUCTION
Material and attire undertaking which fills in as a basic a piece of people's ordinary ways of life is one of the most extreme global enterprises withinside the world. There has been a significant ascent sought after from created nations prompting increment in yield and business, development of farming area and age of unfamiliar trade for non-industrial nations especially after end of multi fiber understanding in 2005.

Other than the situation of texture undertaking in innovation of business, it's far thought about as one of the important intentions of toxins worldwide. The texture creation strategy is known for eating resources like water, fuel and heaps of substance mixes for a gigantic scope. Mechanical assessments show that extra than 35% of synthetic mixes dispatched withinside the environmental factors are an outcome of assorted texture cure and coloring measures, furthermore admission of shimmering water through method of methods for texture endeavor is cycle 3 trillion gallons worldwide and changed into used to give 60 billion Kilograms of texture. Around, 8500 L of water is benefited from in creating 1 Kg of cotton that is equivalent to creation one sets of blue denims as expressed through method of methods for worldwide asset for nature. With rising issues which incorporates climate change, deficiency of benefits, exacting regula-conservative system and call for supportable materials along the edge of creating texture consumption, the trouble of ecological mischief through texture producing should be tended to earnestly . There is a ton of writing to be had in setting of manageability issues in texture venture, for instance, related with water, squander and energy the executives. A couple of sentiments additionally are to be had at the mechanical segments of texture endeavor , yet not one of the specialists has investigated the predominant canvases within side the setting of usage of those issues for big business. We have endeavored to find and look at the overall writing from those points simultaneously as planning the common examinations and on the equivalent time finding considers holes and providing predetermination bearings. Considering the rise of overall texture convey chains and guidelines, it transforms into appropriate to take a gander at those issues on the usage stage on this venture to make certain manageability in assembling and admission of materials.

OBJECTIVE OF THE STUDY
- To understand sustainability troubles throughout the fabric deliver chain as diagnosed with the aid of using researchers.
- To recognise the effect of the enterprise on surroundings with appreciate to air, water and waste management.
- To understand drivers and motivations for companies to head inexperienced in fabric sector.
- To respond towards sustainable troubles in fabric companies.

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RESEARCH METHODOLOGY

Amongst the data collected for review, more than 50% of empirical studies reported followed quantitative techniques. Regression analysis and structure equation modelling were used for analysis of quantitative studies, whereas studies of qualitative nature followed case study.

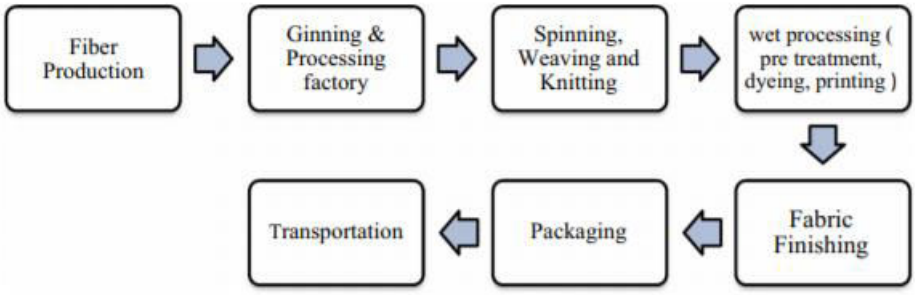

Fig. 3 Textile production supply chain *Source* Adapted with changes from Gardetti and Torres (2012)

Fig. 3 Textile production supply chain *Source* Adapted with changes

To take a look at the reaction of companies closer to the adoption of sustainable practices, we observed the sustainability method framework is very applicable which might be acknowledged to offer fee financial savings and aggressive blessings to companies. They classify the sustainability techniques into types: technique pushed and marketplace pushed. Strategies that offer fee-saving blessings to companies through development in environmental performance are acknowledged to be technique pushed techniques, while marketplace pushed techniques have a tendency to differentiate companies merchandise from their competition within side the market through diversification into new marketplace segments or remodeling merchandise to be greater environmentally sensitive.

Textile industry production chain

It describes the fabric enterprise manufacturing chain which starts with the trans- formation of cotton and wool (herbal fibres) and chemical fibres into yarns and fabric. These fabric are then transformed to apparel which incorporates garments, household goods and industrial textile . The deliver chain starts with acquiring fibre from uncooked fabric which causes soil degradation. Ginning is the preliminary technique wherein fibre is first separated from the cotton seed. In this technique, cotton is then vacuumed into tubes which then passes via a dryer to reduce its moisture and improve the quality of fibre. In the next step, cleaning system is used to get rid of leaf trash, sticks and different overseas fabric; then, the cotton is spun into yarn that is similarly used for weaving and knitting . During moist processing, pre- treatment, printing and dyeing of fabric is carried out.

Environmental influences begin on the preliminary degree of manufacturing itself and may be grouped under categories such as uncooked fabric manufacturing wherein chemicals toxic in nature is used in developing cotton both in shape of fertilizers, insecticides, and insecticides or in shape of emissions all through the manufacturing of artificial fibres. Next is the degree of fabric manufac turing, dyeing and finishing wherein chemicals and solid wastes arising from yarn production of herbal fibres are launched in water. Industrial estimates display that fabric remedy and dyeing money owed for 20% of business freshwater pollutants , plentiful chemicals used and launched all through fabric remedy and dyeing effects in degradation of labor environment in conjunction with growing numerous environmental issues until dealt with earlier than disposal. Movement of items alongside the fabric deliver chain constitutes the 0.33 level of environmental impact. At this level, power is ate up in shape of presenting gasoline for machinery, mechanization of vintage flora and transportation required for distribution of materials. The air pollutants generated all through production procedure own extreme fitness dangers which reason occupational sicknesses usually determined among employees uncovered to cotton and hemp dust . Product disposal with the aid of using purchasers is likewise among the predominant reasons of environmental affects as maximum aren't aware about environ- intellectual results of the ways of disposal. The affects of fabric and apparel deliver chain at the surroundings are summarized in Fig. 4.

Why do fabric corporations go green?

Drivers act as motivating elements that have a tendency to form the organizational approach and has the electricity to steer the reaction of corporations . In the beyond few years, fabric corporations have proven a few momentum toward incorporating sustainable con- cepts in their supply chains. Also, the observe through cotton incorporated shows that in a 20-year framework from 1990 to 2009, the textile industry has shown reduction in consumption of natural resources (water, energy) towards processing of cotton

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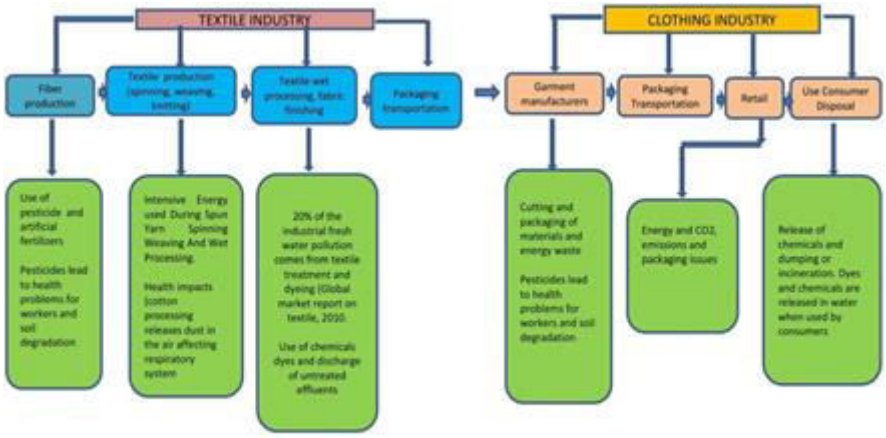
by 50%, along with reduction in chemical use by 40% globally , but increasing environmental issues indicate the need for continuous improvement in this industry. This section highlights numerous factors found in the literature that plays a role in motivating firms to go sustainable along with barriers faced by them.



(Adapted with changes from Gardetti and Torres 2012; UNDP Report 2012)

Fig. 4 Environmental/social impacts of textile and clothing industry along the supply chain

Firms are pushed with the aid of using the preference to contribute closer to solving environmental problems along with sheer motive to earn profits. The control literature mentions a variety of inner and outside elements that can inhibit companies' overall performance and act as a catalyst for companies to put into effect sustainable practices. Human and economic sources are of maximum significance in shaping firm's environmental techniques in conjunction with different inner organizational sources. Internal elements such as managers' own ethical commitment and values closer to sustainability, their preference to benefit a completely unique inexperienced role withinside the marketplace, to enhance company's reputation are a number of the organizational elements which assist companies put into effect inexperienced practices. Also, for fabric companies, this fashion is visible to be accompanied greater with the aid of using companies in European international locations which suggest their proactive nature closer to imposing techniques aiming to obtain inexperienced aggressive advantage. Apart from those elements, companies additionally get tormented by its institutional surroundings consisting of suppliers, regulatory companies and competitors. A marketplace strain in shape of call for from foreign customers and manufacturers and strain from regulatory our bodies closer to environmental clearance additionally have an impact on companies to take in environmental decisions. Firms reaction is likewise said to be motivated with the aid of using institutional individuals as it could alternate companies' perspective in phrases of the value worried and advantage performed thru environmental control. Pressure from regulatory our bodies thinking about elevating social problems to enhance labour standards, the fitness of employees, community development, etc. has prompted numerous NGOs and institutions to run sustainable campaigns to denounce such practices. For example, because of those pressures main manufacturers inclusive of Reebok, Nike, H&M and Levis have began out to contain socially accountable measures of their deliver chains .

We additionally tested studies on elements or limitations which abate companies' growth in adopting surroundings-pleasant practices withinside the fabric industry, and those had been identified to be a loss of economic sources and vulnerable law on a part of authorities. Alongside, a masses of literature argues that authorities involvement ought to reduce com- panies value and in go back inspire them to put into effect surroundings-pleasant practices. Most of the limitations had been located to be purchaser centric. The following paragraph gives a discussion on diverse drivers and limitations from purchaser perspective closer to adopting sustainable practices as they play a key role in the fabric industry.

Consumer as a driver for environmental Initiatives

Recent research on this area display that younger purchasers are plenty greater worried and privy to the environmental troubles. While a few segments of purchasers are willing to pay for natural garments, there are an identical range of research assisting that purchasers hesitate to pay as they understand natural garments or garments fabricated from recycled fabric to be of lower quality, out of trend and rather priced. In maximum of the research, mindset and behavior hole has additionally been observed to be affecting client buy behaviour as they choose cheap elegant garments over moral dimensions in phrases of rate and quality. Some also are of the view that outlets have to adhere to socially accountable practices instead of mentioning to consumers.The want

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for consistent alternate in style enterprise is one of the dominating elements limiting the environmental development in fabric firms along with different elements primarily based totally on purchasers' belief that moral style merchandise are old school and dearer than the traditional garments. Various ecolabels for fabric enterprise which include Global Organic Textile Standard (GOTS), Better Cotton Initiative, Oeko-Tex Standard, EU-Ecolabels for fabric (EU-2002), Organic Exchange etc.

In our opinion, the client-pushed limitations may be addressed through operating on each of the 5 tiers of the client shopping for selection system. At this stage, support from the government, NGO's and commercial sources can play a significant role. Moving on to third and fourth stage, i.e. stage of alternative evaluation and purchase where consumers compare conventional product benefits with green products, is governed by a willingness to pay by consumers. At this stage, style and price of ethical clothes often lead to the gap between purchase intention and final purchase. Consumers' trust plays a key role at this stage. Brands, ecolabels and standards hence help in aiding the consumer for their decision-making. These standards, in fact, provide additional information to consumers along with building their trust

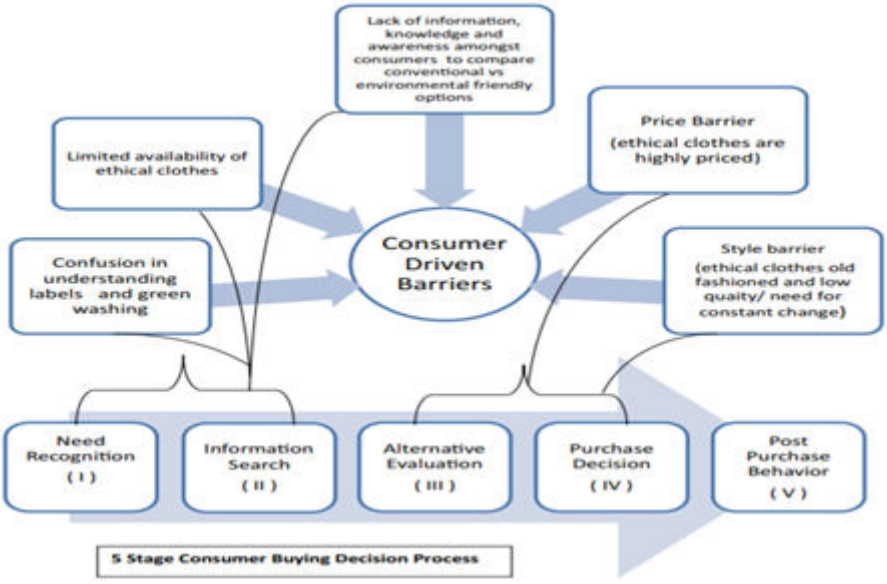

Fig. 5 Consumer-driven barriers and consumer buying decision process

The last stage of buying decision process, i.e. post-purchase behaviour which bridges the gap in consumers purchase intention and actual purchase is highly determined by the quality and durability of product; it is therefore retailers' prime responsibility to ensure that ethical clothes provide the same satisfaction to consumers as conventional clothes. In a nutshell, providing complete information about product composition highlighting where and how a product was made through a medium of ecolabels can be a potential solution in increasing visibility of the product and thereby making it easier and much more convenient for consumers to make sustainable buying decisions

Strategic response of textile firms in favour of environmental management
To conquer the task to be environmentally sustainable, corporations are responding in numerous approaches :

Process-pushed sustainability strategy
Strategies that offer value-saving benefits to corporations in shape of development in envi-ronment performance are referred to as procedure-pushed sustainability techniques. These techniques assist corporations in decreasing depletion of resources, together with a discount in fabric utilization and electricity intake with the aid of using corporations.

Market-pushed (product stewardship) sustainability strategy
Strategies that differentiate firm's merchandise from their competition withinside the market via diversifying into new marketplace segments or making adjustments withinside the current product to cause them to extra surroundings pleasant are referred to as marketplace-pushed sustain- cappotential techniques. These techniques endorse that environmental dangers and lifestyles cycle charges have to be minimized in merchandise or services.

Most famous procedure-pushed techniques as diagnosed from preceding studies had been directed toward procedure intensifications, remodeling of manufacturing procedures to be

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environmentally touchy via cleanser manufacturing technologies. These techniques had a high attention to gain value benefits with the aid of using enhancing environmental performance, while corporations that undertake marketplace-orientated techniques had been observed to be diversifying into environ- intellectual markets or marketplace segments, operating toward advent of environmentally orientated merchandise including water-pleasant forms of denim and making use of textile standards. The research also concludes that firms that have implemented and practiced green initiatives are found to be showing better firm performance, better stake- holder relations, reduction in cost and improvement in environmental efficiency

CONCLUSION

This assessment paper has offered the motivations for fabric companies to undertake environmental practices, the reaction of the companies in shape of each process- and market-pushed techniques and principal drivers and boundaries to implementation of those practices. Various internal factors in shape of nature of paintings and position of personnel additionally play a position in figuring out the quantity to which sustain- cappotential practices are adopted, and a essential shift in organization's way of life is needed to reap sustainable production. More insights are had to discover organization-associated elements which include control commitment, managerial perceptions closer to environmental problems and their reaction in shape of strategies, inner aid constraints etc, mainly withinside the case of nations which function manufacturing hubs for the fabric enterprise and wherein environmental pollutants is a first-rate issue. An powerful communication method wishes to be enforced in the proper way to bridge the space among clients' perceptions and organization's efforts.

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VERSATILE PARTICLE SWARM ALGORITHM TO SOLVE POWER SYSTEM VALVE-POINT ECONOMIC DISPATCH PROBLEMS

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ABSTRACT
The objective of this paper is mainly to develop a versatile particle swarm (VPS) algorithm for solving the valve-point economic load dispatch (ELD) problem. Though particle swarm optimization (PSO) algorithm is easy to implement and has been shown to perform well on various power system optimization problems, they may get trapped in a local optimum due to premature convergence when solving the larger constrained problems. In the proposed VPS algorithm, the PSO parameters such as inertia weight and acceleration factors are made versatile on the basis of objective function. By adapting the PSO parameters, it not only avoids premature convergence but also explores and exploits the promising regions in the search space successfully. The feasibility of the proposed VPS algorithm is tested on two different test systems. The results obtained by the VPS algorithm is found to be better than other heuristic approaches in terms of solution quality, convergence speed and computation time.

Keywords: Non-linear optimization, power generation dispatch, valve-pont effect,versatile parameters, VPS algorithm

NOMENCLATURE

F_i	total fuel cost of the generators
a_i , b_i , c_i	cost coefficients of generator i
e_i , f_i	valve-point cost coefficients
P_D	power demand
P_L	transmission losses
B_{ij}	line loss coefficients
$P_{i,min} , P_{i,max}$	minimum and maximum generation of unit i
P_i , P_i^0	current and previous power output of i^{th} unit respectively
UR_i , DR_i	up and down ramp limits of i^{th} unit respectively
k	index of prohibited zone
nz	number of prohibited zones of unit i
m	number of particles in the swarm
N	number of dimensions in a particle
K	pointer of iterations (generations)
$V_{i, n}^{k}$	velocity of particle i at iteration k
C_j	acceleration factor
$rand_j$	random number between 0 and 1
$X_{i, n}^{k}$	current position of particle i at iteration k
$pbest_i$	personal best of particle i
gbest	global best of the group
W_{max}	final weight
W_{min}	initial weight
Iter	current iteration number

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$Iter_{max}$	maximum iteration number
w_i^k	inertia weight of i^{th} population at kth iteration
F_i^{k-1}	objective value of i^{th} solution at (K-1)th iteration
F_{pbest}^{k-1}	objective value of pbest solution at (K-1)th iteration
F_{gbest}^{k-1}	objective value of gbest solution at (K-1)th iteration
$C_{1,i}^k$, $C_{2,i}^k$	first and second acceleration factors for the ith population at kth iteration respectively

1. INTRODUCTION

As energy need increments and since the fuel cost of the power generation is extravagant, diminishing the power generation expenses turns into a significant theme. The fundamental objective of economic load dispatch (ELD) is to determine the complete generation between the generating units monetarily, while the imperatives are fulfilled. Accepting linearity and expanded monotonically, the fuel cost characteristics of the power generation units, the traditional approaches such as the linear programming algorithm [1], quadratic programming algorithm [2], non-linear programming algorithm [3], dynamic programming algorithm [4,5], Lagrangian relaxation algorithm [6,7] etc. were applied. While each of them has some defects: it would generate large errors to use the linear programming algorithm to linearize the ED model; for the quadratic programming and nonlinear programming algorithms, the objective function should be continuous and differentiable; the dynamic programming algorithm may result in the ‘‘curse of dimensionality’’; and the Lagrangian relaxation algorithm would lead to the phenomenon of solution oscillation. These suspicions end up with infeasible for real applications due to their nonlinear behaviours of prohibited operating zones (POZs) or valve-point loading (VPL) impacts in generators. The real ELD problem itself has intricate and nonlinear attributes with constraints, which are quickly portrayed in the accompanying.

Multi-valve steam turbines have various steam affirmation valves that are opened consecutively to get ever-expanding yield of the units and the valve-point impacts produce a wave like heat rate characteristic. Additionally, many power generation units, specifically those which are provided with multi-fuel source lead to the issue of deciding the most monetary fuel to consume. Thus, multi-fuel units, and VPL impacts ought to be considered to take care of a practical ELD issue, which makes hard the finding of the ideal solution. Due to the non-linear features of the generating units, it is hard to acquire the ideal solution with the traditional strategies.

To conquer the above trouble, a few computational methods, for example, genetic algorithm (GA) [8–10], improved GA [11], differential evolution (DE) [12], ant colony optimization (ACO) [11], artificial bee colony (ABC) [13], cuckoo search algorithm (CSA) [14], gravitational search algorithm (GSA) [15] and firefly algorithm (FA) [16] were implemented for solving the ELD problems.

Among existing heuristic approaches, the PSO is lately demonstrated to be an efficacious strategy to solve complex optimization problems. It was developed by Eberhart and Kennedy in 1995 [17] and motivated by the social behaviour of organisms such as fish schooling and bird flocking. PSO has been found to be robust in solving continuous nonlinear optimization problems [18]. Recently, PSO has been successfully employed to solve the ELD problem while considering generator constraints [19] and non-smooth cost constraints [20]. In order to solve the ELD problem of units with valve point effects effectively, a hybrid solution methodology integrating PSO and sequential quadratic programming (SQP) and modified PSO have been proposed [21–23].

The advantages of PSO algorithm are easy principle, less parametric change, and simple usage. Additionally, its robust global investigation capacity makes its intermingling exceptionally quick, and simultaneously, it can escape from the nearby optima to get the global solution. The most noticeable legitimacy of VPS algorithm is its quick convergence. In any case, in the first VPS algorithm, each particle refreshes its situation as per the best arrangement, in view of the impact of the neighbourhood best arrangement, each particle will constringe about the nearby best arrangement rapidly. To improve the robustness and the capacity of the algorithm in searching the global solution, versatile PSO parameters are utilized to avoid the nearby optima. This suggested strategy is christened versatile particle swarm (VPS) algorithm.

The suggested VPS algorithm for the ELD problem is demonstrated to have achievable application in two diverse test systems addressing VPL impacts. By contrasting the VPS algorithm and different heuristic approaches, the suggested approach is discovered to be the quick in looking through speed when deciphering

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the valve-point ELD problems. The significant contribution of this research work is to introduce a VPS algorithm to fathom the ELD problem addressing the VPL impacts.

2. MATHEMATICAL MODEL OF VALVE-POINT ELD PROBLEM

The objective of ELD problem is to find an optimal power generation schedule while minimizing fuel cost and also satisfying various power system operating constraints.

2.1. Objective Function

The ELD problem is formulated as follows:

$$Minimize\ F = \sum_{i=1}^{ng} F_i(P_i) \tag{1}$$

The total fuel cost of the generators is defined by:

$$F_i(P_i) = a_i P_i^2 + b_i P_i + C_i \tag{2}$$

Considering the valve-point effects, the fuel cost function of the ith thermal generating unit as shown in Figure 1 is expressed as the sum of a quadratic and a sinusoidal function in the following form:

$$F_i(P_i) = a_i P_i^2 + b_i P_i + C_i + \left| e_i \times \sin(f_i \times (P_{i,min} - P_i)) \right| \tag{3}$$

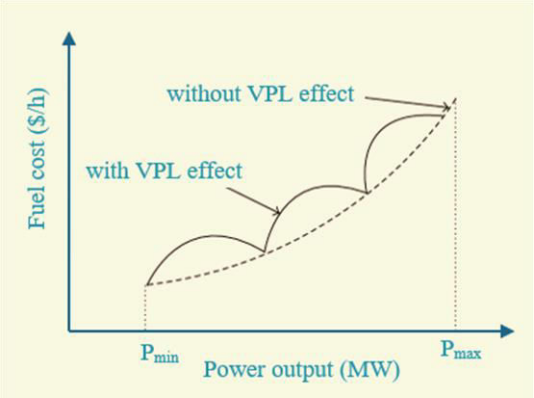

Figure 1. Fuel cost curve with VPL effect

2.2 Constraints

Power balance constraints

The total power output of the generators should be equal to the sum of power demands and total transmission losses and is given by:

$$\sum_{i=1}^{ng} P_i = P_D + P_L \tag{4}$$

The transmission losses are expressed as

$$P_L = \sum_{i=1}^{ng} \sum_{j=1}^{ng} P_i B_{ij} P_j + \sum_{i=1}^{ng} B_{0i} P_i + B_{00} \tag{5}$$

Generator capacity constraints

The output power of each unit needs to be restricted with inequality constraints between their limits. This constraint is given by

$$P_{i,min} \le P_i \le P_{i,max} \tag{6}$$

Ramp rate constraints

The actual operating range of all the generating units is limited by the ramp-rate constraint and is given as follows:

$$P_i - P_i^0 \le UR_i \tag{7}$$

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$P_i^0 - P_i \le DR_i$

3. OVERVIEW OF PSO

PSO is inspired by the social behavior of organisms like bird flocking and fish schooling. In PSO, it randomly initializes the population of particles in the search space. The particle velocity is adjusted according to the experience of the particles and its companions. Each particle tries to modify its position using the following information:

i. the current position,

ii. the current velocities,

iii. the distance between the current position and pbest and

iv. the distance between the current position and gbest.

The velocity and position of each particle are modified by the following equation:

$$V_{i,n}^{k+1} = W \times V_{i,n}^{k} + C_1 \times rand_1 \times (pbest_{i,n} - X_{i,n}^{k}) + C_2 \times rand_2 \times (gbest_n - X i_{,n}^{k}) \quad (8)$$

$i = 1, 2\ldots\ldots m; n = 1, 2\ldots\ldots N$

$$X_{i,n}^{k+1} = X_{i,n}^{k} + V_{i,n}^{k+1} \text{ if } X_{min,i,n} \le X_i^{k+1} \le X_{max\,i,n}$$

$$= X_{min\,i,n} \quad \text{if } X_{i,n}^{k+1} < X_{min\,i,n}$$

$$= X_{max\,i,n} \quad \text{if } X_{i,n}^{k+1} > X_{max\,i,n} \quad (9)$$

The inertia weight factor can be set as decreasing linearly from W_{max} to W_{min}, according to the following equation:

$$W = W_{max} - (W_{max} - W_{min}) \times Iter / Iter_{max} \quad (10)$$

4. VPS ALGORITHM: AN IMPLEMENTATION PERSPECTIVE TO VALVE-POINT ELD PROBLEMS

The general PSO is highly depended on its parameter settings. So, the performance of the PSO is not satisfactory. The velocity of the particle greatly depends on inertia weight and acceleration factors. In this paper, these parameters are made adaptive on the basis of objective function. The solution algorithm of VPS is as follows:

Step 1: Initialize the population

The generator capacities are the particles of the ELD problem. The minimum and maximum limits of the particles, maximum number of iterations to be performed are specified. The particles of the population are randomly initialized according to the limit of generator units.

Step 2: Determine the fitness function value of all particles

The constrained IM optimization problem is converted into an unconstrained optimization problem by using parameter-less penalty function method. The fitness function value can be computed as follows:

$F(X) = F(X)$ if X is feasible

$F_{max} + CV(X)$ otherwise (11)

where, F_{max} is the objective function of the worst feasible solution in the population. CV(X) is the overall constraint violation of solution X.

Step 3: Select pbest and gbest solutions

The fitness values obtained above for the initial particles of the swarm are set as the initial pbest values of the particles. The best value among all the pbest values is identified as gbest.

Step 4: Update the population using VPS algorithm

The position of the particles i.e. generator values are changed using Eqs. (8) and (9). The PSO parameters are modified as follows:

i)Versatile inertia weight factor (VIWF)

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The inertia weight factor controls the impact of the previous velocity on the current one. So, it is important to make the balance between exploration and exploitation by the proper adaptive value for each iteration. 'W' is

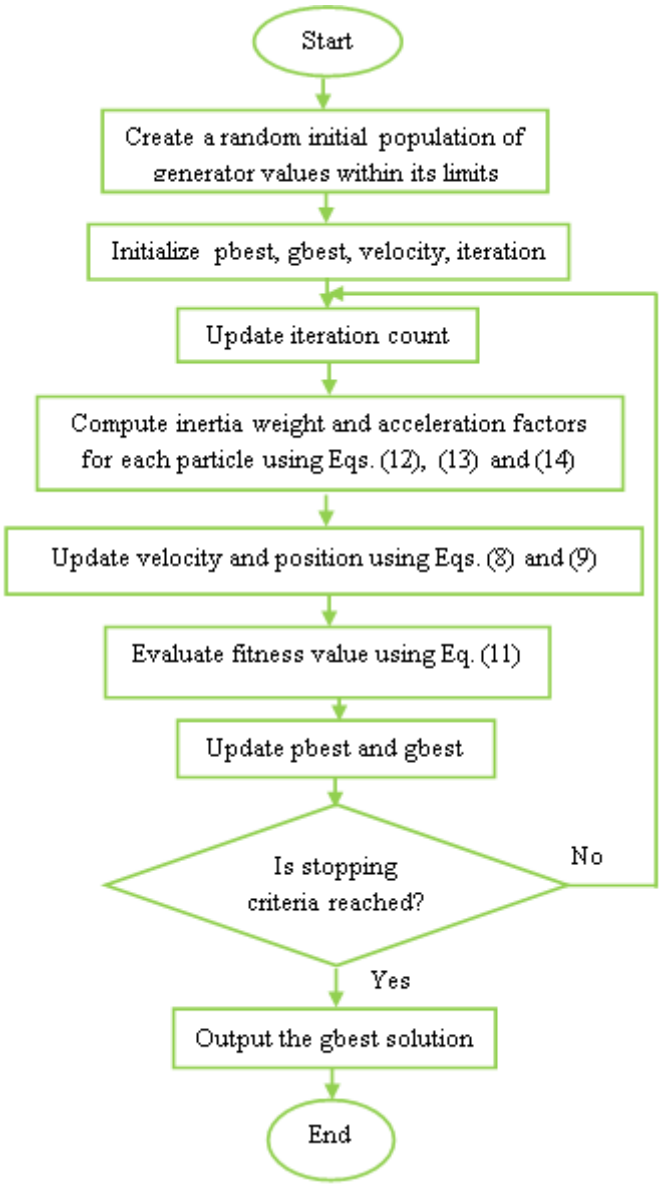

Figure 2. Flowchart of the proposed VPS algorithm-based valve-point ELD problem made dependable with difference of the annual cost of pbest and gbest solution. The MIWF can be calculated as follows:

$$W_i^k = W_{min} + \frac{F_{pbest}^{k-1} \times \left| F_i^{k-1} - F_{pbest}^{k-1} \right|}{F_i^{k-1} \times \left| F_i^{k-1} - F_{best}^{k-1} \right|} \quad (12)$$

ii)Versatile acceleration factors

For higher objective function of the concerned solution, higher acceleration factors are required to provide higher step size or velocity for maintaining the global exploration. Whereas, lower acceleration factors are needed for the fine tuning of the concerned solution that have lower objective value. Considering this concern, the following acceleration factors formulas are used:

$$C_{1,i}^k = \sqrt{\frac{F_i^{k-1}}{F_{pbest}^{k-1}}} \quad (13)$$

$$C_{2,i}^k = \sqrt{\frac{F_i^{k-1}}{F_{gbest}^{k-1}}} \quad (14)$$

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From the above equations, it can be concluded that the acceleration factors are always greater than unity.

Step 5: Update the velocity and position of each particle

The velocity and position of each particle in the population are modified according to Eqs. (8) and (9).

Step 6: Update pbest and gbest solutions

The fitness cost value is calculated using Eq. (11) for updated particles in the swarm. If the fitness value of each particle is better than the previous pbest value, the current value is set to be pbest. If the best pbest is better than the gbest, the value is set to be gbest.

Step 7: Check stopping criteria

If the number of iterations does not reach the maximum generation number, go to step 4, otherwise the particle that generates the latest gbest is taken as the optimal generation schedule and its cost value.

The flowchart of the proposed VPS algorithm-based valve-point ELD problem is shown in Figure 2.

5. TEST CASES AND SIMULATION RESULTS

The suggested VPS algorithm is employed to solve the ELD problems in two diverse test systems and its effectiveness has been compared with other heuristic approaches such as GA [11], DE [12], ACO [11], ABC [13], CSA [14], GSA [15], FA [16] and θ-PSO for demonstrating its adequacy. The programs of VPS algorithm are implemented using Matlab.

5.1. Selection of parameters for VPS algorithm

For implementing the VPS algorithm, the population size and maximum number of iterations are chosen as 20 and 100 respectively and the optimal solution is obtained in 50 trials. In VPS algorithm, the parameters such as inertia weight and acceleration factors are modified with respect to the current objective function value. The behavior of 'W' with the number of iterations is given in Figure 3. It is observed that 'W' varies between 0.1 and 1. The variations of C1 and C2 with the number of iterations have been shown in Figure 4. During initial iterations C1 and C2 take higher values as the individual objective function value will generally be large. But, as the convergence reaches, all the solution strings will reach the gbest and pbest solutions making the objective value of individual solution very close to that of the pbest and gbest solution. Thus, the acceleration factors reach unity as the convergence is approached.

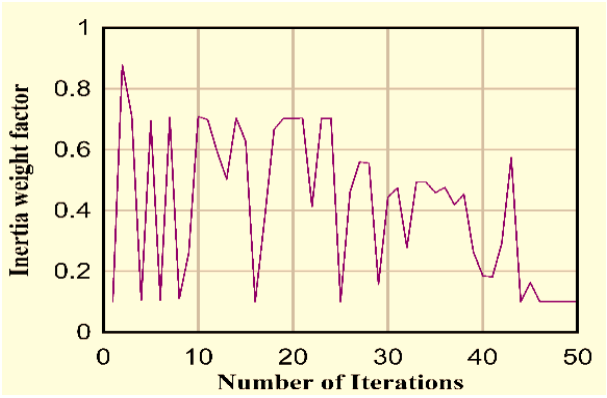

Figure 3. Variations of 'W' with number of iterations

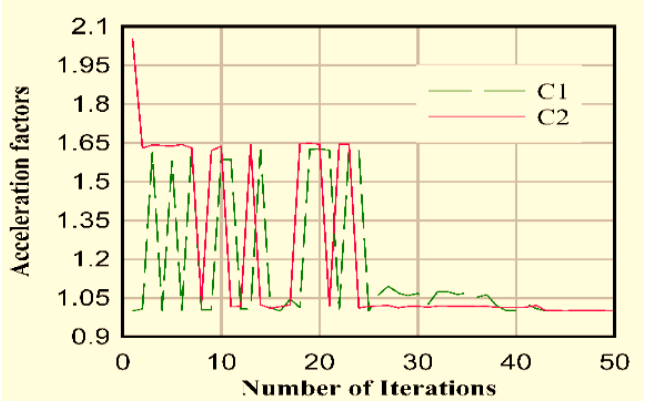

Figure 4. Variations of C_1 and C_2 with number of iterations

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5.2. Portrayal of the test systems

Test system 1

A system with 13 generators with quadratic fuel cost characteristic with VPL effects is utilized. The input data are accessible in [22]. The power demand is 1800 MW. Transmission loss has not been addressed. The result obtained from the proposed VPS strategy has been compared with ABC [13], GSA [15], FA [16], DE [12] and θ-PSO [22]. Their best solutions are tabulated in Table 1. The convergence characteristic of the VPS algorithm for 13-unit system is appeared in Fig. 2. The least, mean and greatest fuel costs, standard deviation and CPU time obtained by ABC [13], GSA [15], FA [16], DE [12] and θ-PSO [22] over 50 independent runs are given in Table 2.

Table 1: Best generation dispatch results obtained by different heuristic strategies for test system 1

Unit	ABC [13]	FA [16]	θ-PSO [22]	VPS
1	628.3148	628.31852	628.3185	628.3153
2	149.5070	149.59952	149.5978	222.7536
3	222.8608	222.74912	222.7512	149.5869
4	109.8665	109.86655	109.8665	109.8667
5	109.8655	109.86655	109.8665	109.8667
6	109.8647	109.86655	109.8665	109.8667
7	109.8565	109.86655	109.8665	109.8667
8	109.8641	60	60	109.8667
9	60	109.86655	109.8665	60
10	40	40	40	40
11	40	40	40	40
12	55	55	55	55
13	55	55	55	55
Minimum cost ($/h)	17963.86	17963.8308	17963.8297	17963.8292

Table 2: Statistical comparison among various heuristic strategies for test system 1

Strategies	Minimum cost ($/h)	Mean cost ($/h)	Maximum cost ($/h)	Standard deviation	Mean CPU time (s)
ABC [13]	17,963.86	17,987.22	17,995.11	-	16.39
GSA [15]	17963.84	18041.21	18910.31		150.32
FA [16]	17963.8300	18029.1600	18168.8000	148.542	10.3695
DE [12]	17963.83	17965.48	17975.36	-	-
θ-PSO [22]	17963.8297	17965.2055	17980.2030	4.3807	-
VPS	17963.8292	17964.5078	17972.3964	3.7461	2.34

Test system 2

A large-scale system with 40 thermal units is used over here. The input data are available in [22]. The power load demand is 10500 MW. Transmission loss has not been incorporated. The best results acquired from the ABC [13], FA [16], θ-PSO [22] and VPS algorithm are presented in Table 3. The statistical results obtained by ABC [13], GSA [15], FA [16], DE [12], θ-PSO [22] and the suggested VPS algorithm over 50 trials are tabulated in Table 4. The convergence characteristic for the 40-generator system obtained by the suggested VPS algorithm is appeared in Fig. 4.

Table 3: Best generation dispatch results obtained by different heuristic strategies for test system 2

Unit	CSA [14]	θ-PSO [22]	FA [16]	VPS
1	112.0518	110.8	110.8099	110.9748
2	111.4948	110.8006	110.8099	110.8012
3	97.5626	97.3999	97.40230	97.3649
4	179.8	179.7331	179.7332	179.8130
5	88.9834	87.9566	92.707	87.8764
6	140	140	140	140
7	299.9993	259.5996	259.6004	259.7241
8	284.9506	284.5996	284.6004	284.6732

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9	284.9653	284.5996	284.6004	285.1468
10	130.0006	130	130.0028	130
11	94	168.7998	168.8008	94
12	94	94	168.8008	94
13	214.7621	214.7598	214.7606	214.6549
14	304.5194	394.2794	304.5204	394.4630
15	394.2799	304.5196	394.2801	394.2776
16	394.2793	394.2794	394.2801	304.3807
17	489.2802	489.2794	489.2801	489.2816
18	489.2776	489.2794	489.2801	489.3486
19	511.2797	511.2794	511.2817	511.2793
20	511.2799	511.2794	511.2817	511.2793
21	523.3012	523.2794	523.2793	523.2793
22	523.2928	523.2794	523.2793	523.2793
23	523.2892	523.2794	523.2832	523.2793
24	523.4340	523.2794	523.2832	523.2793
25	523.2839	523.2794	523.2793	523.2796
26	523.2810	523.2794	523.2793	523.2795
27	10	10	10	10
28	10.0009	10	10	10
29	10.0014	10	10	10
30	92.0666	97	87.8008	97.8365
31	190	190	189.9989	190
32	190	190	189.9989	190
33	190	190	189.9989	190
34	199.9998	164.7998	164.8036	164.7998
35	199.9998	200	164.8036	200
36	200	200	164.8036	200
37	110	110	110	110
38	110	110	110	110
39	110	110	110	110
40	511.2824	511.2792	511.2794	511.2791
Minimum cost ($/h)	121425.61	121420.9027	121415.0522	121414.6592

Table 4: Statistical comparison among various heuristic strategies for test system 2

Strategies	Minimum cost ($/h)	Mean cost ($/h)	Maximum cost ($/h)	Standard deviation	Mean CPU time (s)
GA [11]	121996.40	122919.77	123807.97	320.31	320.31
PSO [11]	121800.13	121899.57	122000.80	84.21	84.21
ACO [11]	121532.41	121606.45	121679.64	45.58	92.54
ABC [13]	121441.03	121995.82	122123.77	-	32.45
CSA [14]	121425.61	-	-	-	-
θ-PSO [22]	121420.9027	121509.8423	121852.4249	-	103.966
FA [16]	121415.05	121416.57	121424.56	1.784	4.72
VPS	121414.6592	121416.32	121423.72	1.4362	3.48

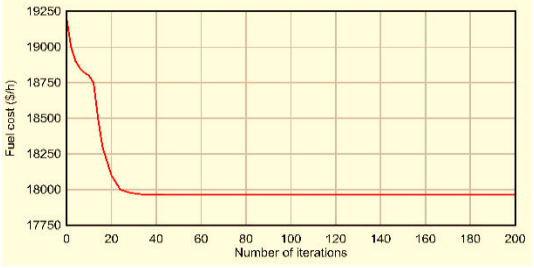

Figure 5. Convergence behavior of VPS algorithm for test system 1

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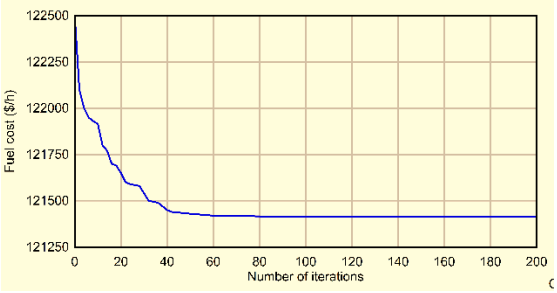

Figure 6. Convergence behavior of VPS algorithm for test system 2

5.3. Examination of VPS algorithm with other existing heuristic approaches

Solution quality

The best fuel costs acquired by the VPS for two diverse test systems are given in Tables 1 and 3. These costs are better compared with the results produced by the other existing approaches. The corresponding results are additionally displayed in Tables 2 and 4. Furthermore, the statistical analysis for most extreme, least and mean fuel costs, and standard deviation acquired by different algorithms are also presented in these Tables. It is worth noting that the recital of the VPS algorithm is better than the compared existing approaches with regard to the obtained solution quality.

Computational effectiveness

From Tables 2 and 4, it is observed that the time taken by the VPS algorithm to accomplish the optimal fuel costs is least among the other compared existing techniques. Consequently, the VPS algorithm demonstrate fundamentally better computational efficiency than the other approaches.

Degree of reliability

Tables 2 and 4 offer that out of 50 independent runs the VPS algorithm arrives the minimum fuel costs 48 and 46 times for two different test systems respectively. The proficiency of the VPS algorithm to offer the optimal solution is 96 % for test system 1 and 92% for test system 2. Consequently, the recital of the VPS algorithm is much superior compared with the other existing algorithms.

6. CONCLUSIONS

In this paper, a VPS algorithm has been acquainted to tackle the valve-point ELD problem. In the suggested algorithm, versatile dynamic parameter control system is employed to determine the values of the acceleration and inertia weight factors. To verify the supremacy and viability of the suggested strategy, simulation test cases are realized by using VPS algorithm to tackle the valve-point ELD problem of a 13-unit and 40-unit test systems. The experiment results display that the proposed VPS algorithm can produce better dispatch result with lower generation cost in conjunction with better solution quality, computational effectiveness and convergence characteristic in deciphering the valve-point ELD problem compared with other existing strategies. Accordingly, the VPS algorithm offers another successful strategy to figure out the ELD problem.

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AMBEDKAR THOUGHT ON JOURNALISM AS A SOURCE OF LIVELIHOOD

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ABSTRACT
India's press history is the history of the country's free movement. The Indian National Congress was attributed to the Indian press in large measure its success and role. It happens that the background of the independence struggle was the history of the conference men. The past of the Indian press is also the history of Congressmen's newspapers. The history of the poor class has been forgotten, and the history of the high caste in India has been praised. The bulk of the people who agree that Mahatma Gandhi is a fantastic journalist fail to talk about Ambedkar's journalism or Ambedkar's magazines. The various perceptions of the history of the battle for independence and the press in India are necessary to recognise. By profession, he was a lawyer. Still, he spent his life towards journalism. This paper explores Ambedkar's media interactions, thoughts on media as a source of his livelihood.

Keywords: Ambedkar,s profession, Ambedkar's journalism.

INTRODUCTION
A popular journalist was also Dr. Ambedkar. Via his articles, he offered a voice for social revolution. Gandhi decided to spread the cause of the untouchables in 1933. It is necessary to remember why he did this. Only after the Poona Pact did he begin that. The Indian media that admire Gandhi's attempts to establish a newspaper for the intouchables never mention Ambedkar's efforts to handle four newspapers. Ambedkar's struggles, his philosophy, demanded media, a mouthpoint, while pre-conference media failed to talk about the poor citizens. Ambedkar felt deeply that the newspapers would transform millions of poor people's lives. The Marathi press of Dr. Ambedkar proclaimed modern politics, new ethics and a proper social order (Pandian, 2005). Ambedkar launched a collection of newspapers named MookNayak, Bashiskrit Bharat, Janta, weekly regular (weekly magazine).

The journals strongly engaged in the construction and mobilisation of a country for the independence struggle. B.R. at the same moment. Via his newspaper Janata, the dalit's difference from the conventional 'country,' Ambedkar began spreading a different view of dalith. Instead of digging into the Gandhian agenda to create a cohesive and homogenised nation-space, Ambedkar called for a separate dalit space (Narayanan, 2005). BhaskarraoKadrekar was the publisher of the weekly Janata.

Ambedkar, with the encouragement of Maharaja of Kolhapur, began Mook Nayak on 32 January 1920. While his official publisher wasn't Ambedkar, he was behind it and his mouthpiece. The newspaper Kesari declined to print Mook Nayak ads. The fact that the Kesari declined to declare its printing, even though it was requested to do it as paid ads, can indicate how aggressive and unfavourable the times were. And that was when Tilak was still alive! There was a mistake (Keer,1954). The printing of the advertising of their newspapers in their magazine was not only deemed untouchable to touch the oppressed citizens. There are many comparisons between American Black media and the marginalised Indian community.

In the 1840s, Willis A.Hodges, a black person, excepted Sun editorials which opposed Blacks' vote. So he first attempted the solution to entry by writing a response to the editorial released by the newspaper at a fee of $15. But it was changed and brought as an advertisement when the newspaper removed the post. "The Sun shines for all white men but not coloured people" Hodges objected but was told. He claimed that the mass-circulation journal is similar to the opinions of Blacks and began Ram's Horn in 1847 (Wilson &Guteirrez, 1985).

In addition, he was acquainted with the newspaper business, and Ambedkar lived and trained in America for many years. He had selected an independent newspaper for the poor citizens because he was aware that Indian mass media would represent Caste Hindus ideas.

The titles Ambedkar selected for his journals simply confirmed the goal of his journals. The Janata (Population), the Bahiskrit Bharat (Excluding Indian citizens) and the Mook Nayak (Stupid Leader), were connected explicitly to the oppressed people. In March 1927, under the leadership of Ambedkar, marginalised citizens marched to the Chowder Tank in Mahad to demonstrate their claim to drinking water from that tank. For this reason, the Hindu caste groups targeted the unarmed. This was the first large open conference for depressed groups. This issue has become a big topic in India. Two camps were displayed in Maharashtra journals. Some have denounced this brave effort by the depressed groups, some have taken refuge under the statute, some have thrown crocodile tears claiming it has been poor in the city at the end of the conference.

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Some have congratulated Hindus for their bold behaviour in vindicating their rights (Keer,1954). The flow of critique had to confront Ambedkar now. He sensed like never before the need for a mouthpiece. So Ambedkar began in Bombay on 3 April 1927 with his two-night Marathi article, Bahishkrit Bharat. He clarified the intent of the journal and stated that he was a jurist because he believed that one could really be backed up by an autonomous career for one's own personal livelihood in order to operate a journal for the welfare of citizens (Keer, 1954).

Despite a great deal of reports on how journalism practise in recent decades has changed, little attention has been given to work undertaken by journalists outside of jobs, for example, their lives, personal networks, family circumstances, the overall working and living condition. Such problems are likely to become more common as journalism is mobile, contingent and unpredictable. This article describes the thoughts of Ambedkar on Journalism as a profession.

THE PROFESSION OF AMBEDKAR AND JOURNALISM

It should be remembered that around 1928 Dr. Ambedkar was too busy because by that time he had become a leader of the untouchables, held a comprehensive, endless number of meetings, conferences, arguments, visits often and continuously. He was busy with the strike by the workers from Bombay, Started Committee, the entry of the temple, idol worship issues, murder trials, replying to Simon commission reports, dealing with issues such as the system of Khoti, sacred wearing ceremony etc. Around October 1929, he also broke his legs. The entrance to the temple of Nasik started (March 1930). He has also been busy setting up schools for the untouchables' students. He couldn't find time to accept briefs under that schedule, he almost stopped taking cases and started his work as a teacher (too much time just to keep his family alive). He had always spent his precious time in building up his own people. In addition, it should be noted that he had to receive permission to register his proceedings even in order to report to the Simon Commission. He defended the "Chirner shooting case" (ended 1931). The round table conference was also busy. His life in the period 1928-1931 is clearly understandable from below. They were forced to abstain from appearing before the court for ill health (hunger strike effect) and forced by barbaric police treatment and were totally indifferent to the procedure. The court judging the revolutionaries was in fact a "comedy stage" where the head comedians were the public prosecutor, supporters and witnesses and the head lunatic the ruler and the victims were the revolutionaries, the public at large, the defenders and the press.

We can, therefore, not imagine the case being fought by Dr. Ambedkar. Dr Ambedkar, however, must have kept him informed in his editorial (The Janata), on this case as evident from his writing. Please note: ShivramRajguruji was from its province in Mumbai. It is safe to hope for Dr. Ambedkar's ideals, waves, and fragrance. The revolutionaries were never opposed by Dr. Ambedkar. He himself supported "violence when needed and non-violence as much as possible." The British, including Dwyer, suspected of being a revolutionary in contact with a certain organisation, should also be noted. It is therefore fair to suppose he would have taken Ambedkar to save many freedom fighters from going to gallows if this case had been chosen.

AMBEDKAR' THOUGHT ON JOURNALISM AS A SOURCE OF LIVELIHOOD

In the newspapers, Ambedkar maintained the universal values of humanism founded on fairness, liberty, democracy, compassion and the brotherhood. These ideals require a close look at the ideological fight he struggled for not only against the Brahmin republic but also in taking these principles to a logical conclusion.

As an order, the caste system came into being by subverting abominably two basic components of human life. The first component is the material and the second one is the ideological-cultural-spiritual one. The material base had a clear equality theory among the cultures before the emergence of varnashrama dharma. The fair base was reversed by a caste system which led to four big changes. (a) systemically depriving land control the entire wealth base); (b)operative job separation; (c) wage allocation and (d) surplus appropriation. (a) operating division of labour and labour. Three items are merged in the second section. Aboriginal communities around the world, and especially in India, have a high spirituality, which represents the way they live in society. This cultural life is the philosophy it maintains and embraces in a more philosophical style. The ideological, cultural and spiritual component was replaced by a foreign ideology of slavery, subjugation, dehumanisation, which forced the indigenous populations to agree that their indigenous traditions are deficient and should conform with the doctrines of the Hindu codes. Thus, inhuman violence was practised by indigenous masses. Their birth is decided and destined for the social space and rank in every particular jati (caste). So it all concentrated on 'bornness.' Therefore the indigenous peoples had to apply their whole energy and commitment in the regeneration from the lower caste context to a higher ladder on a socioeconomic, ideological and theological basis. This rise – in the context of the "shastras" – was not possible until the upper lords of the caste in present birth became diligently serviceable, thus preventing trauma at the next birth (George, 2011).

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This order was not only an ideological system, but a political and economic structure as well. It formulated and encapsulated the entire development mechanism which later remained within its confines for centuries with only slight changes. In divine faith pronouncements focused on the divide of purity and pollution, economic and political fact of inequality is justified, established and glorified. Traditionally, ritualistic coercion and coercive domination ensured that they would supply the lord of the upper caste with essentially free labour. The fact that land or territory was denied them only aggravated by making them entirely dependent on their caste owners, who had full control of intelligence, power, development and livelihoods (George, 2011).

Throughout the past of the Indian psyche, these two historic elements have persisted together with its toxic packets, structures, operations, policies and coalitions with similar forces.Historically, it has led and is likely to lead society in social inequality, political repression, economic injustice, cultural dominance, and misogyny. Therefore the first step towards a just, equal and harmonious community, as rational individuals and human beings, is bound to strive towards the development of a casteless, non-class, free patriarchy, fair and prosperous society, above the caste, ethnicity, sex, ethnicity, cultural context etc. Such a phase will not be only the fight for one's identity, but the battle for the absolute redemption of civilisation. A culture of the same, unjust and unfair.

It is where today we return to Dr. Ambedkar's war with Brahminism as a historical compulsion. Ambedkar and his philosophy, especially those who come out of the world's repressed, marginalised, outsiders and abused arts, have untiring and unmistakable significance in the present historical sense. With the current issues in mind and focusing on the days of Ambedkar, in the uncertainty and crisis of India, it is important to discuss the current climate and the detrimental effect it has on the lowest rung population. How, in his own time by journalism, Ambedkar responded to these aspects. Without it, analysing or questioning the importance of Ambedkar's journalism and literature, challenging him how the matter is treated, defining allies and rivals, and tactics that he has adopted will be politically problematic.

JOURNALISM AS A PROFESSION IN TODAY'S CONTEXT

We also argued that studies in media have a "work-centred" viewpoint on periodism in a previous paper (Örnebring, Möller and Grip 2015). The primary factor for this centring in the workplace is the prevailing technical status as a term for analytics. Professionalism requires that incidents and conditions outside the work should not be impacted and should not be affected. Your work and private life should be distinctly divided if you are trying to be "professional." In addition, professionalism is usually characterised as a social function efficiency, emphasising the emphasis on job and workplaces analytics. In the Steiner study of autobiographies of female journalists (Steiner 1998), she argued that "professionalism" as a valid study or even debate deliberately excludes "life outside work."

As an alternative to discipline, we argue that livelihoods are a stronger term in the present age of increased precariousness to examine transition and consistency in media. The definition is drawn from developmental and anthropological research and applies to the incorporation of income-generating behaviours into the whole of life (Lipton and Maxwell 1992). "Existence includes incomes, both cash and cash, as well as social institutions (children, families, compounds, villages, etc.), sex relations, and the proprietary rights necessary to support and maintain a certain living standard" (Ellis 1998, 4). Livelihood captures the disparity between income/employment and livelihood, where it depends on the personal family, social network, place, etc.

Initially, and even mainly, the idea of livelihood was introduced in Third World rural development contexts (in particular, hunger problems), but in other contexts, there are still studies applying the livelihood concept (e.g. Schmidt-Kallert 2009). Notwithstanding their empirical emphasis, subsistence studies often provide an overview of a much wider social context typical in journalism.

In order to evaluate a relatively high profile, a high-income profession in the global north, a term initially applicable to workers far below the poverty line may be deemed unsuitable. Also displaced western journalists are already in better living conditions than, say, Rwandan farmers, no matter how serious the "crisis in journalism" is. We do think, however, that this term contains aspects of day-nalism, which literature has historically generally neglected. Many working practitioners in countries like the UK and Sweden (Örnebring 2016, 109-110) experience a chaotic "hustle" lifestyle, in which permanent work is an elusive prize and precarity. In Western countries, journalists are already well on the agenda, but this does not diminish their subjective perceptions of precarity, stress and household tensions.

CONCLUSION

Once a profession was journalism in India. It's now a company. It has no moral role other than soap making. They do not see themselves as the responsible public adviser. The journalism in India is not seen to be its primary or primary responsibility to offer the news in a coloured manner and to show a certain vision of public

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politics that it feels is for the benefit of the society and to rectify and punish without worry all those who have taken an incorrect or dumb course. It has been his principal responsibility to embrace a hero and worship him. The news gives rise to sensations, rational opinions of unreasonable passions, and calls on the minds of those in charge to draw attention to the emotions of the irresponsible. Lord Salisbury referred to the journalism of North Cliffe as written by office boys. Indian reporters are all that and more. It is written to glorify its heroes by drum-boys. Never have the nation's interest been so senselessly sacrificed for the promotion of patriotism. Hero worship has never been so blind as we see it today in India. Ambedkar's thought on journalism has a great legacy to influence today's trade journalism.

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VICIOUS WEB OF AMERICAN DREAM AND THE UNFULFILLED SOCIAL EXPECTATION: A CRITICAL EVALUATION OF ARTHUR MILLER'S*DEATH OF A SALESMAN* AS A TRAGEDY

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ABSTRACT
The main aspect of Arthur Miller's Death of A Salesman is the destruction of the protagonist illusions and fictitious nature, which not only destroys himself, but also that of his families. The play also reveals the main protagonist Willy's contradictory feelings of self-disappointment, rebellion, and remorse. According to Miller, the American Dream form fake expectations that prevent people from being aware of what they have learned to improve their lives and ultimately struggle to get anything done. Willy Loman is a simple man who reflects conventional American achievement ideals. He is now old in his life as a traveling salesman is no longer able to compete successfully in his chosen career. Therefore, the conclusion of his business, he began to review his previous life in order to resolve its worth. His eldest son Biff has come home for inspect at this crucial situation in Willie's present, and Willie's old hope for a conventional success in life is reawakened. But there are also revived past tone between father and son. Again, his son ignores Willie's values and aspirations which hearts him great disappointment. This article tries to portraits real situation which faced America through lastdecade; it also penetrates the people who have unfulfilled dreams or expectation as well as tragedy of their life. To bring its true sense the researcher has used as tools analytical method as well as comparative method for this study. The researcher concludes saying that Miller insists he wants his audience to experience thepain of a life passing without recognition or acknowledgement. This experience might prompt viewers to question their own purposes and values which visualize the vicious web of the American Dream resulting in unfulfilled social expectations in the light of Miller's novel Death of a Salesman.

Keywords: American Dream, American Modern Theatre, Alienation, Western Tragic Hero, Unfulfilled Social Expectation

"In this age few tragedies are written. It has often been held that the lack is due to a paucity of heroes among us . . . for one reason or another, we are often held to be below tragedy or tragedy above us" – Arthur Miller

Arthur Miller's words quoted above characterize Miller's approach in his essay "Tragedy and the Common Man," where he spells out his reasons for writing *Death of a Salesman* as what he considers a traditional tragedy--although his model seems to be a loose amalgam of Greek and Renaissance antecedents.Arthur Miller has played a prominent role in American theater and many of his works became classic. Most critics regard as*Death of a Salesman*is one of his most celebrated plays as one of America's most important visions in American theater. Brenda Murphy believes the play might be an American's greatest drama, and Miller's play contained a fundamental esteem of American farm society. The American Dream here always staysat the center of the game and acts like a guide. *The death of a Salesman* marks final day of Willy Loman's life and search for prosperity in Brooklyn in the late 1940s. Brenda Murphy proclaims that the play is perhaps the greatest dramatic work by an American (and with this play, Miller created "an attack on some of the basic values of American business culture". The game starts with Willy coming back late in the night from his unsuccessful business trip. He has come to an end, not only where he can't regular his work, but where he hesitates between the present and the past. He spoke with his friend name Linda, regarding the look up to the western farm worker of his eldest son Biff. Their father spoke with him in the kitchen to him Biff and his younger brother Happy, who is also visiting too. Linda confesses his two sons about the mental condition deterioration of Willy and about threats to commit suicide. His dad wants to support Biff. Biff and Happy confront with a marketing proposal and claim a loan from Biff's previous boss. Willy wants to ask his employer for local job concurrently, encouraged. They are also inefficient. He was denied Willy's appeal and was shot, and he had also not been accepted by Biff's former employer. Willy tells Charley to take money from his friend. Then, Charley grant him a position but Willy declines the proposal. The culmination is when Biff learns his father's truth about himself. He's urging him to abandon his vision. Willy agreed, in agony, to commit suicide and collect money for life insurance from Biff. Arthur Miller's family somehow resembles Loman's. In the depression Miller's family moved to Brooklyn, lived under precarious circumstances, plagued by their previous financial and social achievement and their fight to regain the American dream – the stability they experienced when Miller was a child. It is an analysis more of the American sense, in fact, that financial success results in social acceptance. Miller's work is no greatest criticism of substantial accomplishment.

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Tragic Hero

Death of a Salesman, formed in 1949, it is now a contemporary theater classic. This is a tale of an ordinary salesman who wishes that he is wealthy and fond of. This is a sad story of Willy Loman, a retailer who mixes past and current with expressionistic scenes. Willy Loman is not a catastrophic hero in romantic tragic figure, there are several discussions on this. Allan Lewis (1970) states, for example, that in contemporary theatre we will redefine the tragedy, because of the fact that Miller 's personality Willy Loman is portraying a new tragic hero. In other words, the traditional definition of "a tragic hero" can't easily be applied to a "real tragic hero." It must be also pointing out that Miller has contributed a great deal to the introduction in his plays of the new theatrical and conventional texture. In his play *Death of a Salesman*, and the narrator is Willy Loman, Arthur Miller redefines in his play the classical ideas of tragedy and tragic hero originating from Aristotle. If you are to investigate if Willy Loman is a tragic hero, you have to find out what is tragedy and who is the tragic hero. This play aims to portray the American-bourgeois tragedy of the common man not as a classic dramatic tale, pathetically recent tragic hero from the 1940s. When you dig at Aristotelian tragedy concept, you might remember that the narrator Willy Loman does not explain it or acknowledge it entirely. Through turn, Arthur Miller stresses the fact that in the 1940s, the United States, which looks for its own heritage because to the difficult results of the commercialized era, Willy Lomano was not a tragic hero of classical tragedy but a present-day tragic hero. Bigsby (1987) interprets Loman's suicide as "designed to liberate the next generation" (p. 167).In his age, Miller created a hero of modernism with a social influence. He then explores both the historical and the modern tragedy to establish his favorite trend of contemporary tragedy. "Aristotelian ideas weigh heavily on a changed planet" (1970, 47). Lewis says. A new kind of romantic character was developed in the Modernist period (from industrialization in the late 19th and early 20th centuries) to respond to the English Renaissance, the Period of Light and Romanticism. The modern hero must be a "simple" individual, not a high estate. The common citizens like Willy Loman at the *Death of a Salesman* were primarily influenced by materialist and bourgeois ideals. The past of the modern hero does not automatically warrant that the narrator has conventional catharsis to finish the plot. He will live without the opportunity to alter his circumstances. Without ending, the tale will end. At "resent-day tragic hero" or the "anti-hero," this new contemporary character. Where did the anti-hero style come from? How did these protagonists spring? What effect? The cure lies undoubtedly in the social and economic consequences from the period between the great American Depression and the after-WII, which impacts most average Americans with the ruthless capitalist system crushing "American dreams." Miller picked the genre tragedy by changing its tenets in order to illustrate the catastrophic consequences of the period.

The American Dream

"American Dream" is the conviction that one may find happiness through wealth with the pioneering virtues of arduous, endurance, creativity and strength. This is the core of our lives as Americans; one way or another we all want to do this. The American dream idea of Arthur Miller's *Death of a Salesman* is claimed to be divided into two interpretations by Harold Clurman: the historical vision and the illusion of business success. Willy Loman had already made a dream legendary, had a home, a car, family and a career, but he was consumed by the idea of business success and tried or at least thought that he tried and did it but was in the process undermining his family. The historical American dream was fulfilled by Willy Loman but he didn't realize it because of his passion. He met Dave Singleman when Willy wanted to go to his brother in the hunt for his uncle. This peaceful, successful career made him think about his decision. Willy seems to have seen a "father figure" in Dave, and he went along the same direction and hoped he would have the same potential and the same results on the track. He saw that he did not achieve the success he wanted after 35 years of his career. He has devoted his life to a career as a salesman who knows his hands are fine, but "he was too snobbed to accept that his own destiny was in a simple carriage as a carpenter." To Willy the distinction between a job with a white collar and a job with a white collar meant a lot, but he didn't do much to get one and stuck with his old job. He and his family were able to achieve average success with his career as a retailer. Willy wanted more, and because he saw that he hadn't achieved it he told his children to see life in the expectation of continuing his course, and realizing his own vision. The American Dream plays a major role in the play as stated earlier in the introduction. In the 1930's, politics became influenced by the Great Depression and the American Dream became a nightmare. What used to be a land of opportunity and expectation became a place of despair. That is, the world of hope, optimism and success icons became a place of desperation. In the hope of getting a job, many farmers migrated to the big towns. The main problem, instead of growth, was survival. As World War 2 began, the situation deteriorated and ultimately had a negative impact on the lives of ordinary Americans. As a symbol of everyone, Willy Loman and her family, the plight of those people can be seen. Miller is the most renowned American playwright since WWII and attracts readers to a fictitious story, which primarily portrays a part of an average American family with an American Dream or Nightmare, about the catastrophic

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consequences of the environment and the politics of the period. In capitalist society, Loman was marginalized and neglected. Like the other common men in society he wants to live and be "noticed": He's a huge guy, don't know. Never did Willy Loman make much money. His name never appeared in the paper/article. He isn't the best character ever met. But, he's a human being, and he is having a terrible problem. Therefore, care must be taken. Like an old dog, he is not supposed to slip into his grave. Be careful, a person needs to be given attention finally. (Act 1, 44) Linda speaks for the common man in civilization in this quote. Linda tries to protect her husband against the negative effects of Willy's system of capitalism. Since Willy is a survivor of the scheme, Linda is protesting the effects of injustice on average people's lives and psychology. Nevertheless, Willy embraces his principles as an Uncle Ben who reflects his values, and who has made the American Dream a reality: like a young god, something such as Hercules. And the sky, the whole world. And the customers I took with me – Loman, Loman, Lomans – and the cheer as he came out! He's going to be great, God Almighty, still. Such a star can never really vanish beautiful! Willy wants to be like Uncle Ben, who has succeeded to achieve the American Dream. (Act 1:54). Willy wants to be respected and a star. His status as a "common man" he wants to get rid of and be wealthy. The vast majority of Americans and people around the world moved to urban centers at the outset of the post-war era to improve their living conditions. Migration halted traditional agriculture and converted people into key groups. Willy's statement "reflects the negative effects of displacement and the nostalgia for past and urban life. Boxed in here, they boxed us. Doors, walls and bricks. Bricks and windows Cars are lined up on the street. Within the neighborhood there is no breath of fresh air. You can't make up a carot in the backyard any more "(Act 1 12). The grain does not expand any more. Miller tracks the materialism, exploitation and bogus agendas of achievement that lead to discontent, loneliness and alienation.

Unfulfilled Social Structure

The irony is that well before *Death of a Salesman*, the bleak view of American life had characterized American television as it rose to maturity and influenced its distinctive styles and themes. For Miller however, this drama was much more focused on the subject of the socioeconomic state of the modern American adult experiencing the paradoxes of the so-called 'American Dream'. When keeping with this subject, the fusion of tragedy and social drama separates Miller's play from the other main figures of the Ibsenian tradition including Bernard Shaw and John Osborne whose social plays are definitely not classified as tragedies. It is the fact that a dramatic aspect is asserted and chosen for in the dramatization of the social theme that puts Death of a Salesman in an excellent role within this tradition of modern social drama. This distinction is evident even in contrast to plays that contain tragedy elements. Indeed, the generic questions involved in a discussion of tragedy in *Death of a Salesman* are not the questions involved in discussions of any play by Eugene O'Neill or Tennessee Williams, also categorized as tragedies. In defense of the tragic status of his play, the author's essay was certainly and helps to a general emphasis on the issue of catastrophe. The nature of the story, the hero's character and perspective along with its conclusion suggest that the action is usually self-conscious. For as long as tragic form shapes the dramatic construct in its totality, the question of purity and authenticity of that form is inevitably involved, not because the play has to be measured against a set of generic requirements and conventions, but more importantly because the specific tragic effect wanted from such a form does not admit mixed tones and moods. Most commentators are now in the opinion that the irrelevance of 'absolute tragedy 'does not mean that tragedy has no place in modern drama. Freeman (2010) writes in Tragedy After Darwin: "What is significant about catastrophic events is not its concrete meaning, but the impression that Western society uses catastrophe to get its own interpretation in a case of crisis" (p.202). Tragedy requires a recovery and an adaptation to the modern condition and most importantly to the fundamental change in the essence of the powers that are portrayed as shaping the modern tragic hero's destiny. Grochaha (2012) writes "High tragedies are replaced by contemporary domestic tragedies, the heroes' tragic destinies are determined not by Destiny but by the alternative of fate: the social, economic conditions in which they live". (p.26) It is clear in *Death of a Salesman* that, from the very beginning, social and economic conditions constitute the factor that decides the central character and their role and tragic destiny. Thus, an investigation of the dramatic cycle and, particularly, the sort of effect that the resolution brought to the issue of social unrest will illuminate a tragic text of the play and its dramatic form in the *Death of a salesman*. Second, the play is definitely characterized by the death of a main character, which is quite rare and important to the distinctive role of the play in contemporary drama. The death of the character takes the play to a dramatic end thus acting as a statement on the social conditions represented from the outset.

Through this analysis, Miller redefined the tragic hero: a social outcome, Willy Loman, becomes a new and tragic hero who sheds a vision of broken social inequality. Though it doesn't say in the play that the insurance money was or not earned by the Loman family, the uncertainty about Willy's American dream and,

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subsequently, its impact in his children is simpler. Yet we have to note that Willy was in the sales business for thirty-five years. The unfortunate news is that he ruined and damaged his family as a result of his fascination with the illusion of commercial success.Therefore,*Death of a Salesman*by Arthur Miller enough to make comprehend everyone the reality, the tragedy as well as false dream of America which is nothing but agony, depression, even death as well.Miller's work as a whole testifies to his concentrated attention on the instabilities and flaws of ordinary Americans as they responded to the de-provincialized urban world, a world increasingly sick of itself. The determining social environment appears in Miller's works as a constant mockery of personal attempts to ground and sustain individual identity.Miller's *Death of a Salesman* embodies the tragic archetypes and elements that traditional theatre has heralded for centuries. The researcher concludes saying that the play serves as one of the pivotal turning points in American drama, because Miller's play emphasizes tragedy for the average, the common, the American man resulting in the truth of unfulfilled social expectations as envisaged in this paper.

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INDIA-BANGLADESH RELATIONS: FROM 1971 TO 2015

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Historically, both India and Bangladesh have close bonding due to their share of common resources and India's contribution during her freedom struggle in 1971. India not only supported the then East- Pakistan for their struggle of independence by training freedom fighters and also getting in global attention to their cause which led to Bhutan immediately acknowledging Bangladesh as independent nation-state [1] followed by India and other nations to establish diplomatic relations with Bangladesh. Foundation of both the countries intimacy lies on their cultural and historical ground that has a common medium of speaking (read Bengali from West Bengal and Bangladesh), the evolving relation between two republic nations is beyond that of strategic partnership, it is of a friendship. There are multiple institutional mechanism between both the nations in the domain of trade, security, power, transport, defence, science & technology etc which is looked by a Joint Consultative Commission (JCC) led by the Ministers of Foreign/External Affairs that coordinates and oversees implementation of initiatives besides exploring further areas of cooperation and mutual development.

Porous borders often becoming key contention between two border guarding forces where a criminal often manages to smuggle in contrabands using complex borders which requires them permission to enter into other nation by that time the criminal manages to go causing in disagreements between forces.

There are incidents on several occasions of firing exchange between security forces of the two friendly nations that resulted in displacement of locals residing in the area. The relations between the two countries decorated when anti Indian government came to power in Bangladesh but improvement in 1966 with the return of the Sheikh Hassina's Awami League that saw in signing treaty related to Ganga sharing on December 12,1996 , India signing line of credit of 200 crore to Bangladesh government on June 20, 1999. The bus service between Dhaka and Calcutta started on June19, 1999 to boost friendship and mutual economic cooperation and the idea of initiating a transit route through Dhaka to north eastern states of India received huge opposition and evoked nationwide protests as the leader of opposition and anti-India group felt it to be a compromise to national interest.

High Level Visits and Exchanges

Regular key high-level visits and exchanges take place between the two countries and after assuming office , even in the current context the external Affairs Minister of India Sushma Swaraj led her first foreign visit to Bangladesh and even hon'ble president Pranab Mukherjee choose Bangladesh as his first state for visiting after assuming office like same gets reflected from Bangladesh side when Hon'ble President Md Abdul Hamid visited India in December 2014 which stood as first by ceremonial head after gap of 42 years[2].

Border Security & Management

India and Bangladesh shares a long complex border of about 4096.7 km. India's longest land boundary in comparison to border shared with other neighbours and Bangladesh which shares border with two nations India and Myanmar has large part of border with India therefore challenges also arises in these long border which includes issues of enclaves of India and Bangladesh located in each other's countries that are on talks for being settled. The history of such enclaves or "chitt mahal" as known in local language is results from the game of **chaupar** that were played long back by the kings[3]. While the residents of these erstwhile enclaves who hold their nationalities despite being in different territory continues to suffer from getting benefits from various welfare measures of respective governments.

In terms of cooperation related to security number of agreements have been signed between both the countries important being the Coordinated Border Management Plan (CBMP) signed in 2011 that aims to make synergy

[1] See https://www.thehindu.com/news/international/south-asia/bhutan-not-india-first-recognised-bangladesh/article6677033.ece

[2] See https://economictimes.indiatimes.com/news/politics-and-nation/bangladesh-president-abdul-hamid-arrives-on-6-day-official-visit-to-india/articleshow/45563935.cms?from=mdr

[3] See https://scroll.in/article/725804/india-bangla-land-swap-was-the-worlds-strangest-border-created-by-a-game-of-chess

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in efforts of both the Border Guarding Forces for preventing cross border illegal activities and crime rackets that disturbs the peace and tranquillity along the India-Bangladesh border.

The 2014 settlement of the maritime boundary arbitration following UNCLOS (United Nations Convention on the Law of Seas) between India and Bangladesh has been accepted as victory of friendship by both nations as both the nations went to seek in solution at Hague voluntarily[4].

In terms of defence both nations have signed agreements to cooperate on defence which involves private companies from India providing in defence equipments. the major constraints for industrial growth in Bangladesh has been the shortage of power.

CHALLENGES BETWEEN BOTH NATIONS

Trade

The friendly relation and virtue of geography has made Bangladesh to choose India as its biggest trading partner. The first Trade Agreement between India and Bangladesh was signed in year of 1972.The trade relationship has witnessed a setback owing to rising gap in bilateral trade deficit from Bangladesh side with India specially with the increase in informal import that causes loss in revenue bypassing the import duty. India remains Bangladesh's biggest source of import whereas export is not that level that has brought in mixed reactions in Bangladesh. While drawbacks are cited for the setback related to trades at the Bangladesh side which includes poor testing, storing and logistics facilities[5].

The informal or illegal trade that is carried in most geographically challenged porous borders is blamed to be primary reason for deficit in official trade and revenue. Government from both sides often accuse each other's border guarding forces to be involved in supporting the smuggling by collecting money which has added to spoilt relation.

Since 2011, India has supported duty free and quota free access to Bangladesh on all tariff lines except tobacco and alcohol under South Asian Free Trade Area (SAFTA)[6]. India and Bangladesh has established border haats for benefitting local bordering population in Indian states of Meghalaya, Assam and Tripura that will boost the local produce on both sides where trade will take place in both currencies[7].

in January 2010 during the visit of Bangladesh PM to India, India announced a US$1 billion Line of Credit (LOC) as a goodwill gesture for covering projects in public transportation, roads, railways, bridges and inland waterways etc. In addition to LOC funds the Indian government also provides various other grants which includes special project 'Aid to Bangladesh' and projects that focus on construction of school/college buildings, laboratories, dispensaries, deep tube wells, community centres, renovation of historical monuments/buildings etc.

Connectivity

India-Bangladesh stands as a example of good cross border relation related to connectivity between its neighbours through all modes of transport. The movement of goods by road is facilitated by Land Customs Stations (LCSs) and Integrated Check Posts (ICPs) along the border. The Inland Water Trade and Transit (IWTT) has been operational since 1972 which permits movement of Bangladeshi goods over barges/vessels from India through the river systems of Bangladesh on eight specific routes. The Coastal Shipping Agreement signed during the visit of Prime Minister Narendra Modi to Bangladesh in June 2015 has also permitted direct sea movement of containerized/bulk/dry cargo between the two countries.

The railway project Maitree has received immense success linking both the nations that first started journey in 2008 and has been receiving overwhelming response to increase its run due to huge demand[8]. As SAARC as

[4] See https://www.thehindu.com/news/national/bangladesh-wins-maritime-dispute-with-india/article6191797.ece

[5] See https://www.thedailystar.net/news-detail-121294

[6] See https://www.jagranjosh.com/current-affairs/first-border-haat-of-tripura-opened-at-srinagarfeni-border-1421222077-1

[7] See https://economictimes.indiatimes.com/news/politics-and-nation/india-bangladesh-to-set-up-border-haats/articleshow/6865282.cms

[8] See https://timesofindia.indiatimes.com/Railways-is-mulling-to-run-another-passenger-train-Maitree-Express-between-India-and-Bangladesh-to-cater-to-the-needs-of-passengers-of-both-the-countries-Former-External-

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whole is one of the least regional integration in world where the lack of connectivity was planned to be overcome by implementing the Bangladesh, Bhutan, India and Nepal – Motor Vehicle Agreement (BBIN MVA)[9]. The BBIN MVA which involves only 4 nations and not whole SAARC is belved to facilitate the trade and make easy movements for motor vehicles in the particular region but have started receiving opposition from Bhutan as it is feared over its clean air getting polluted as the Himalayan kingdom is known for being one among few still having purest air in world. The anti-India group in Bangladesh has also rasied objection against Indian use of Bangladeshi road which they feel will be a threat to their national security.

Water

Water is always considered a crucial source of livelihood hence all human settlement are found close to water resources. Between India and Bangladesh the issue related to farraka barrage that remains a issue which is believed to have originated after Treaty of friendship and Peace was signed between prime ministers of two nations in 1972. The treaty focused on water sharing of Ganga river is opposed by both the nations with their view where the Bangladesh suggests it was made unilaterally using India's power to pressurize the newly formed nation in signing 30 years agreement whereas India points to less water available for its port in Kolkata and national thermal power corporation at farakka. Out of 54 shared rivers between India and Bangladesh Teesta river forms crucial for Bangladesh agriculture which if not settled can bring in dry season to Bangladesh.

India and Bangladesh shares many natural resources including 54 rivers[10] for which a bilateral Joint Rivers Commission (JRC) was established in 1972 to ensure collaboration between the two countries to maximize benefits from common river systems. The Ganga Waters Treaty signed in 1996 for sharing of waters from river Ganga during lean season (January 1-May 31) has also worked satisfactorily which also has regular meetings to take stock related to implementation of the provisions of the treaty.

Security concerns

The Illegal immigration has become a matter of security concern in all nations that often led to grievous violence in the host country due to over burden on resources as no country is ready to share its resources to unaccounted illegal immigrants as these resources are actually dedicated for the citizens of country

India is working to install fencing in international border in multiple phases besides providing lighting systems to illuminate international border for preventing illegal migration. The border guarding forces carries out cooperative measures like joint patrolling of the border areas and further cooperation with local police agencies to check drug and arms trafficking and illegal immigration especially the trafficking women and children. It is found that majority of Bangladeshi women are forced in prostitution in India where they have entered India in a motive to settle in rural areas of West Bengal or go far flung places like Mumbai and Delhi where they are not easily identified being Bangladesh and they easily disguise themselves with other Indian Bengali speaking labor force. The immigrants from Bangladesh also settle in Indian north-eastern states like Nagaland which is found majority to be the Muslim immigrant population of Bangladeshi.

Bangladesh is increasingly being used as a transit point for drug trafficking by local drug peddlers and influential drug mafia which are found to be transnational in nature that involves heroin and opium from Burma to transport to different destinations. Bangladesh's administration related to Narcotics Control has not been successful in preventing Bangladesh being used as transit route for trafficking heroin to Europe from Southeast Asia[11]

Anti Terror Cooperation

The India's Ministry of Defence has got in Bangladesh's cooperation on most occasions in effort for stopping anti-India terror and insurgent outfits operating from Bangladesh which includes arrests of top ULFA cadres including Arabinda Rajkowa to the Indian Security agencies. Bangladeshi law enforcement officials helped to decode growing on anti-India terror activities backed by Pakistan based terror outfits in association

Affairs-minister-Pranab-Mukherjee-had-flagged-off-the-first-Matree-Express-linking-Kolkata-and-Dhaka-Bangladesh-in-2008-It-would-be-the-second-passenger-train-running-between-these-two-countries-if-the-proposal-is-given-a-final-shape-soon-/articleshow/11540382.cms

[9] See https://www.sasec.asia/index.php?page=news&nid=238&url=bbin-agreement-on-motor-vehicles-signed

[10] See https://www.dnaindia.com/india/report-bangladesh-a-country-that-shares-54-rivers-with-india-1584128

[11] See https://www.incb.org/documents/Publications/AnnualReports/AR2007/AR_07_English.pdf

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with militants in Bangladesh, because of close proximity to India with its porous border which can be used to carry out attacks in India.

India's security concerns vis-à-vis Bangladesh also focus on use of Bangladeshi soil as safe sanctuaries enjoyed by few anti-Indian militant groups with roots in India like ULFA, Islamic terrorist groups like Muslim Liberation Tigers of Assam (MULTA), the Independent Liberation Army of Assam (ILAA) and the People United Liberation Front (PULF) alongside pro-AL Qaeda organizations of Pakistani origins supported by the ISI such as the LeT, HuJI, and Harkat-ul-Mujahideen (HuM), who often supports insurgency in India's northeast from and through Bangladesh pushing in illegal migration into Assam and West Bengal and also take care for the flow of funds from abroad to separatist elements in India Bangladesh region besides their route of money laundering through India-Nepal and India-Bangladesh region, etc. Bangladesh, in relation to India ensures that no large anti-Indian sentiments are brewed in its soil which can actually result in involvement of local citizens making it lead to sour relation between the two friendly nations

EXTERNAL INFLUENCES

Inside Bangladesh there has always been a voice against India by anti india group who feels that Indian government is trying to influence its internal matter and suggests that Bangladesh should expand beyond India to reach other larger powers like china. This internal turmoil led to trouble scenario for the Prime minister of Bangladesh who faced dilemma about choosing before her visit to India or China in January 2010. India scholars have suggested Bangladesh using China for balancing against India with Prime Minister Hasina's visit to China immediately after India trip came in the form of bitterness in India where related transit facilities were extended to China as given to India.

Bangladesh even sought Chinese cooperation in developing a highway passing through Myanmar to Yunan province in China alongside construction of a rail network on that same area . Bangladesh was found to invite China in construction project related to Chittagong port , and a deep sea port at Sonadia Island which contributes to bitter relation as China's increasing access to the region specially at Myanmar naval base in Hanggyi Islands and the monitoring station, established at Coco Island in the north of India's Andaman and Nicobar Islands gives way for China to encircle India as part of its String of Pearls strategy.

Post 1975 Bangladesh has often tried to move away from India and seen maintaining a very close relationship with China for its economic and military needs which over the years have matured resulting in several loans , social contacts, cultural exchanges, academic interactions, infrastructural development and military sales at reduced prices making China emerge as one of the major supplier of arms to Bangladesh's armed forces.

China, Bangladesh and Myanmar have been discussing on 900 kilometer Kunming Highway linking Chittagong with Kunming via Myanmar that will lead to better trade exchange for the nations. The Bangladesh - China relations have extended nuclear energy as well where in 2005 signed the Bangladesh-China Cooperation Agreement on the Peaceful Usage of Nuclear Energy which was to assist Bangladesh in developing peaceful nuclear energy for power generation and other developmental purposelike Defense Cooperation Agreement with China in 2002.

The Chinese quest for regional power and then global power should be taken into account that makes it necessary to have cordial relation with Bangladesh by an effective partnership.

Capacity-Building initiatives

India has been conducting a large number of training programmes for interested and nominated Bangladesh officials / nationals that include police, judiciary, fire-fighters, narcotic officials, nuclear scientists, teachers etc. India has included Bangladeshi nationals to join in elite training institutes of countries armed and police personnel. India has been imparting technical knowledge to Bangladesh citizens through ITEC programme.

Every year India grants scholarships to students from Bangladesh for pursuing general courses in arts, sciences, engineering and also specialized courses for culture, drama, music, fine arts and sports, etc as under its ICCR (Indian Council for Cultural Relations) scheme to expand the cultural relation of India with the world.

Regular cultural exchanges first initiated since 2010 by establishing The Indira Gandhi Cultural Centre (IGCC), High Commission of India, under Indian Council for Cultural Relations of India (MEA) in Bangladesh. IGCC regularly organizes various programmes that include training courses in Yoga, Hindi, Hindustani Classical Music, Manipuri Dance, Kathak and Painting. The courses are widely being accepted by Bangladeshi students

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and IGCC Hindi teacher also teaches Hindi in University and has initiated a Tagore Chair in University of Dhaka since 2011. Since 2012, India also hosts a 100-member Youth Delegation team from Bangladesh annually. High Commission of India has been publishing a print and electronic edition of Bengali literary monthly magazine 'Bharat Bichitra' which has a wide readership in Bangladesh.

Visa

The Indian High Commission in Dhaka and the two Assistant High Commissions in Chittagong and Rajshahi accounts for a larger share of global visas issued by government of India and it is increasing with passage of days as more and more Bangladeshi are coming to India for education, healthcare and other facilities. There is a strong Indian community as well in Bangladesh who are well respected for their skills and contributing to continuing of relation.

There is no visa fee for citizens of both India and Bangladesh while applying for visa as a goodwill gesture.

Conclusion

The India- Bangladesh relations over the years is progressing on a positive side which is better for the region as well and India's relationship with Bangladesh is also an effort to secure its national security which can stand threatened if Pakistan and China gain stronghold in Bangladesh. If India wishes to continue its friendly relationship with Bangladesh, it needs to ensure for taking care of existing issue like Teesta river water sharing, migration and other security challenges with effective coordination with Bangladesh

The relationship between these two friendly countries often witness up and down owing to two crucial factors that are i) oppositional-politics of Bangladesh and ii) existing contentious issues between the two countries that includes issue of water resource sharing, problem of illegal trans-border infiltration ,Pakistani ISI activities in Bangladesh which fuels insurgent groups in North-East India, occasional contention between border guarding forces that led to firing (The issue of enclaves dispute that led to exchange of fire between the Border Security Force (BSF) and the (Bangladesh Rifles) in the Belonia Sector near the Tripura border)

The anti-India forces within Bangladesh suggests that India's contribution towards the 1971 liberation war of Bangladesh was for supporting its own strategic reasons and they believe that asymmetries between the two countries will affect Indo-Bangladesh relations. It is worth mentioning that with the changing of strategic environment Bangladesh no longer remains a small country it plays a crucial role in India's geo-political which includes limiting the anti-Indian activities often found rising in the north-eastern states, neutralizing Chinese influence, to tackle the problem of illegal immigration of Bangladeshis into India, to prevent entry of any other super power in the region.

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CHALLENGING THE POWER STRUCTURES: MAKHDOOM MOHIUDIN AND FAIZ AHMAD FAIZ

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Koee deevana galiyon mein phirta raha

Koee aawaz aati rahi raat bhar

(A forelorn lover kept wandering the streets

And a voice could well be heard all night long)

ABSTRACT
This paper is based on the comparative study of the two revolutionary poets; Faiz Ahmad Faiz and Makhdoom Mohiudin, both the writers were revolutionary writers. This paper tries to locate how these two writers were against the then power structures, and against the structures like tyranny and elitism, oppression, exploitation both these writers has great impression on literature. The present paper focuses on Makhdoom and Faiz's universality of art.

INTRODUCTION

Literature runs in time and space weather through archetypes or its depth of literariness; touches the readers at every coming era. Literature provides space, carries ideology, instructs, and It adds colors to the colorless society. The writers taken in this in this study has continuously written against subjugation and suppression. In his preface to *The Rebel's Silhouette*, Agha Shahid Ali Khan says, "Faiz not only tapped into those (archetypal) meanings but extended them to include the revolution. Waiting for the revolution is as intoxicating as waiting for one's love (35-36).

Faiz Ahmed Faiz (1911-1984) born in Sialkot Pakistan, is, without doubt, the most famous and popular poet of his generation and of the Progressive Writers' Movement. His poetry speak clearly the aspirations, anguish, agony, suffering of people from all walks of life. The poetry covers and transcends boundaries and placed the people of globe in it. He symbolized all that is humane, exalted and challenging in society.

Faiz Ahmed Faiz was a leading and a vigorous voice of 'Progressives'. The year 1951 was a key year of his life he was arrested along with other progressive voices for implanting a coup and rebellion against the then government. In the following lines in the prison Faiz utters his loneliness and at the same time he is very inquisitive and asks in a rebellion tune

Why should I mourn if my tablet and pen

are forbidden,

when I have dipped my fingers in my own

blood until they stain?

My lips have been silenced, but what of it?

For I have hidden

a tongue in every round-mouthed link of

my chain (Preface Aga Shahid Ali)

This is the period when Faiz's career towards poetry returned back, this period was fruitful for him. During this period two collections of poetry *Dast-e Saba* (Zephyr's Hand) and *Zindan Namah* (Prison Poems) came into being and are largely put in the canon of prison poetry. His early poems were traditional focused on the themes of love, humanity, tragedy etc. The shift changed and he wrote, ""Do not ask of me, my beloved, that same love" and "There are other griefs in this world apart from that of love". It was Karl Marx's influence on the world literature and it still influences modern day writers, Faiz also wrote under the influence of Karl Marx to counter the social changes faced by modern man in a capitalistic society. Ralph Russell in his book, *Pursuit of Urdu Literature* writes, "the beginning of the new consciousness, an awareness that a man's love for a woman cannot be the all and end all of life, and that he must be aware of, and deeply affected by, the suffering of the poor and exploited" (Ralph Russell 231), the transference and transition was prevalent in the following lines, "*Lazim hai hum bhi dekhenge, Hum dekhenge"*

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We shall see

Certainly we, too, shall see

that day that has been promised to us

When these high mountains

Of tyranny and oppression

turn to fluff and evaporate

And we oppressed

Beneath our feet will have

this earth shiver, shake and beat

And heads of rulers will be struck

With crackling lightening

and thunder roars.

These verses has universal appeal and it pierces the space and time and it is meant for all time, it is the voice. Faiz Ahmad Faiz's poetry challenges the elitism and it appeals to the suppressed classes of the society, he was of the opinion partition of India lead to the suffering of people, it was elitism who had vested interested in it, for him the most anticipated freedom of common people has been seized by nationalist elites who had no sympathy towards common masses, in one of his famous poem, he shows anguish *"Yeh daagh daagh ujaalaa, yeh shab gazidaa seher Woh intezaar tha jiska, yeh woh seher to nahin"*

"These Tarnished rays, this night-smashed light

This is not that Dawn for which, ravished with freedom

we had set out in sheer longing".

(Dawn of Freedom 1947, Translated from the Urdu by Agha Shahid Ali)

Bol ki Lab Azaad hai tere (Speak Up!) poem is having equally universal qualities.

Bol ki lub zaad hain tere

Bol zabaan ab tak teri hai

Tera sitwa jism hai tera

Bol ki jaan abtak teri hai

Speak up, fot your lips are not sealed

And your words are still your own.

This upright body is yours----

Speak, while your soul isstill your own. (Kumar 39)

It gives voice to voiceless, written soon after the outbreak of the World War, and reflects the very widespread resentment of politically articulate people. The poem, "tells its audience to speak, but does not tell it what to speak, so it remains a spirited call to all free men, in any country and age, to speak out boldly what free men have a duty to say,even though they risk imprisonment if they do so" (Russel 233) .

Makhdoom Mohiddin, is Urdu poet and founder of Progressive Writers Union in Hyderabad India and a Marxist political activist. He became integral part of the Indian literature, art and cinema. He wrote many lyrics, poems and songs for stage, drama and Bollywood. His writing covers the themes like, sacrifice, labor, struggle and pain of the common people. When Makdhoom died, Faiz wrote the following lines in his memory ("Makhdoom ki yaad mein"–Faiz Ahmed Faiz)

Aap ki yaad aati rahi raat bhar,

chandani dil dukhati rahi raat bhar.

Gaah jalti hui gaah bujhti hui,

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shaam-e ghum jhilmilaati rahi raat bhar.

You have been all-night with me

The moon has been all-night with me

Playing hide and seek

And the sorrow shimmer all-night

Like Faiz Ahmad Faiz he also was rebellious against Nizam of the erstwhile Hyderabad state and known as *Shayar-e-Inquilab* (Poet of the Revolution) Best known for his collection of poems titled '*Bisat-e-Raqs*' (The Dance Floor), won him Sahitya Akademi Award in in Urdu in 1969. His universal appeal and voice is found in his following famous couplet

Hayat le ke chalo, kayenat le ke chalo,

chalo to sare zamane ko saath le ke chalo...

Let's walk along with life, lets march with the universe,

When we proceed, let's take the entire humankind along

Makhdoom has used Muslim imagery and symbols like Prophet Mohammad's (S.A.W) grandson's martyrdom as the resistance and resilience in his poems. For example, upon hearing about Martin Luther King, Jr.'s assassination, Makhdoom wrote:

This is not the murder of one man

This is the murder of truth, equality, nobility

The murder of nature's masterpiece is the murder of God

This dusk is the "dusk of the dispossessed"

This dawn, the "dawn of Hunayn"

This is the murder of the Messiah, this if the murder of Husain

(Hyder 162)

Both Faiz Ahmad Faiz and Makhdoom Mohiddin were born at dawn of the twentieth century and have remarkably produced words that show miserable conditions suffered by the power structures and regimes. It also show how the people were subjected to capitalistic oppression and pressures.

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COMPUTATION OF POWER SYSTEM RESTORATION INDICES FOR A TWO-AREA HYDRO-THERMAL INTERCONNECTED POWER SYSTEM

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ABSTRACT
This paper proposes the evaluation of Power System Restoration (PSR) indices based on the Automatic Generation Control (AGC) assessment of two-area hydro-thermal reheat interconnected Power System in a restructured environment. As the simple conventional Proportional plus Integral (PI) controllers are still popular in power industry for frequency regulation for any change in system operating conditions. The control parameters of Proportional gain (K_p) and Integral gain (K_I) of the AGC loop are optimized with Bacterial Foraging Optimization (BFO) algorithm in order to achieve the optimal transient response of the system. The main goal of this study, PSR indices are calculated based on the dynamic output responses and control input deviations of the system for different types of possible transactions and the necessary remedial measures to be adopted are also suggested.

Keywords: *Automatic Generation Control, Bacterial Foraging Optimization, Power System Restoration Indices*

I. INTRODUCTION
The nature of power system restoration problem involves status assessment, optimization of generation capability and load pickup. The rapid system restoration is of prime importance not only based on the time taken for the restoration but also the stability limits in power system restoration problems due to unexpected load variations. The main goal of the restoration problem is to determine a new configuration with the minimum active power loss to restore the maximum loads and an optimal switching sequence to improve costumers' reliability (Adibi and Kafka). The reliability of a power system depends on the frequency and the duration of power outages. A specific restoration strategy can be synthesized by a combination of the milestones and actions based on the actual system conditions (Adibi and others). The main goal of in this study Power System Restoration (PSR) indices are compute based on the Automatic Generation Control (AGC) assessment of interconnected restructured power system.

Nowadays, the electric power industry is in transition to a competitive energy market. In the new structure, Gencos may not participate in the AGC task and Discos have the library to control with any available Gencos in their own or other areas. Global analysis of the power system markets show that AGC is one of the most profitable ancillary service at these systems and from the mechanism used to manage the provision this service in ancillary markets, the bilateral contracts or competitive offers stand out (Shayeghi and others). Various studies on deregulated of power system have brought out efficient design procedures in ensuring the reliability and quality of the system (Mukta, B. S. S). In this point of view adaptive AGC in a deregulated electricity market be designed to consider different types of possible transactions such as Poolco-based transactions, bilateral transactions and a combination of these two (Rakhshani and Sadeh). In this new paradigm, a Disco can contract individually with a Genco for meeting out the power demand and these transactions are done under the supervision of the System Operator (SO).

Several advanced controller structures and techniques have been proposed in literature for AGC. But, these advanced approaches are complicated and need familiarity of users to these techniques thus reducing their applicability. Alternatively, a classical Proportional Integral (PI) controller and its variant remain an engineer's preferred choice due to its structural simplicity, reliability and the favorable ratio between performances and cost (Saikia and others). The different artificial intelligence techniques have been used for the automatic generation control of two area restructured power system. In this paper Bacterial Foraging Optimization (BFO) technique is used to find optimal control parameters of PI controller.

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II. AUTOMATIC GENERATION CONTROL RESTRUCTURED ENVIRONMENT

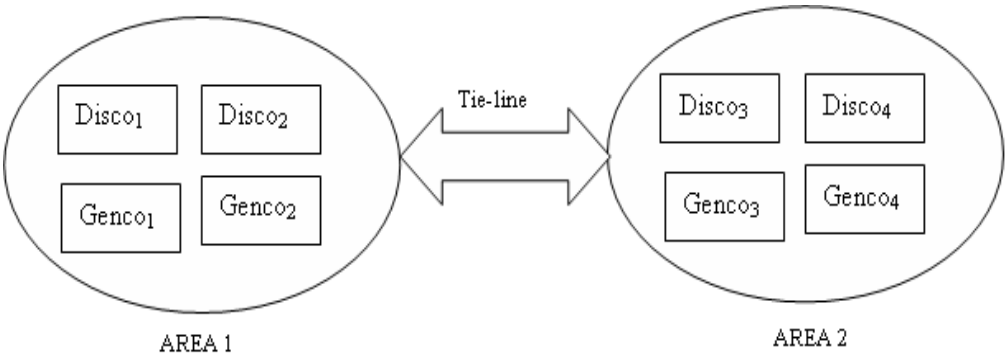

Figure-1: Schematic diagram of two-area power system in restructured environment

In the open market based bilateral contracts, Discos have the freedom to contract with any of the Genco in the own area or other area and these contracts are made under supervision of ISO. Same as Discos, ISO will also have freedom to get power from the same or other area to provide ancillary services to the system. Therefore, in system with an open access policy, there is a need for a LFC model which can be used for the analysis as well as for the development of efficient control strategies. To make the visualization of contracts easier, the concept of a "DISCO Participation Matrix" (DPM) will be used which essentially provides the information about the participation of a Disco in contract with a Genco. In DPM, the number of rows has to be equal to the number of Gencos and the number of columns will to be equal to the number of Discos in the system. Any entry of this matrix is a fraction of total load power contracted by a Disco toward a Genco. As a results total of entries of column belong to Disco_i of DPM is $\sum_i cpf_{ij} = 1$. In this study two-area hydro-thermal interconnected power system in which each area has two Gencos and two Discos. Let Genco_1, Genco_2, Disco_1, Disco_2 be in area 1 and Genco_3, Genco_4, Disco_3, Disco_4 be in area 2 as shown in Fig 1. The corresponding DPM is given as follows

$$DPM = \begin{bmatrix} D & I & S & C & O \\ cpf_{11} & cpf_{12} & cpf_{13} & cpf_{14} & \\ cpf_{21} & cpf_{22} & cpf_{23} & cpf_{24} & \\ cpf_{31} & cpf_{32} & cpf_{33} & cpf_{34} & \\ cpf_{41} & cpf_{42} & cpf_{43} & cpf_{44} & \end{bmatrix} \begin{matrix} G \\ E \\ N \\ C \\ O \end{matrix} \quad (1)$$

where *cpf* represents "Contract Participation Factor" and is like signals that carry information as to which the Genco has to follow the load demanded the Disco. The actual and scheduled steady state power flow through the tie-line are given

$$\Delta P_{tie1-2,\,scheduled} = \sum_{i=1}^{2}\sum_{j=3}^{4} cpf_{ij}\Delta P_{L\,j} - \sum_{i=3}^{4}\sum_{j=1}^{2} cpf_{ij}\Delta P_{L\,j} \quad (2)$$

$$\Delta P_{tie1-2,\,actual} = \left(2\pi T_{12}/s\right)\left(\Delta F_1 - \Delta F_2\right) \quad (3)$$

And at any given time, the tie-line power error $\Delta P_{tie1-2,\,error}$ is defined as

$$\Delta P_{tie1-2,\,error} = \Delta P_{tie1-2,\,actual} - \Delta P_{tie1-2,\,scheduled} \quad (4)$$

Also note that $\Delta P_{L1,LOC} = \Delta P_{L1} + \Delta P_{L2}$ and $\Delta P_{L2,LOC} = \Delta P_{L3} + \Delta P_{L4}$.

The Linearized model of a two-area hydro power system with electrical governor interconnected with thermal reheat power system in restructured environment is shown in Fig 2.

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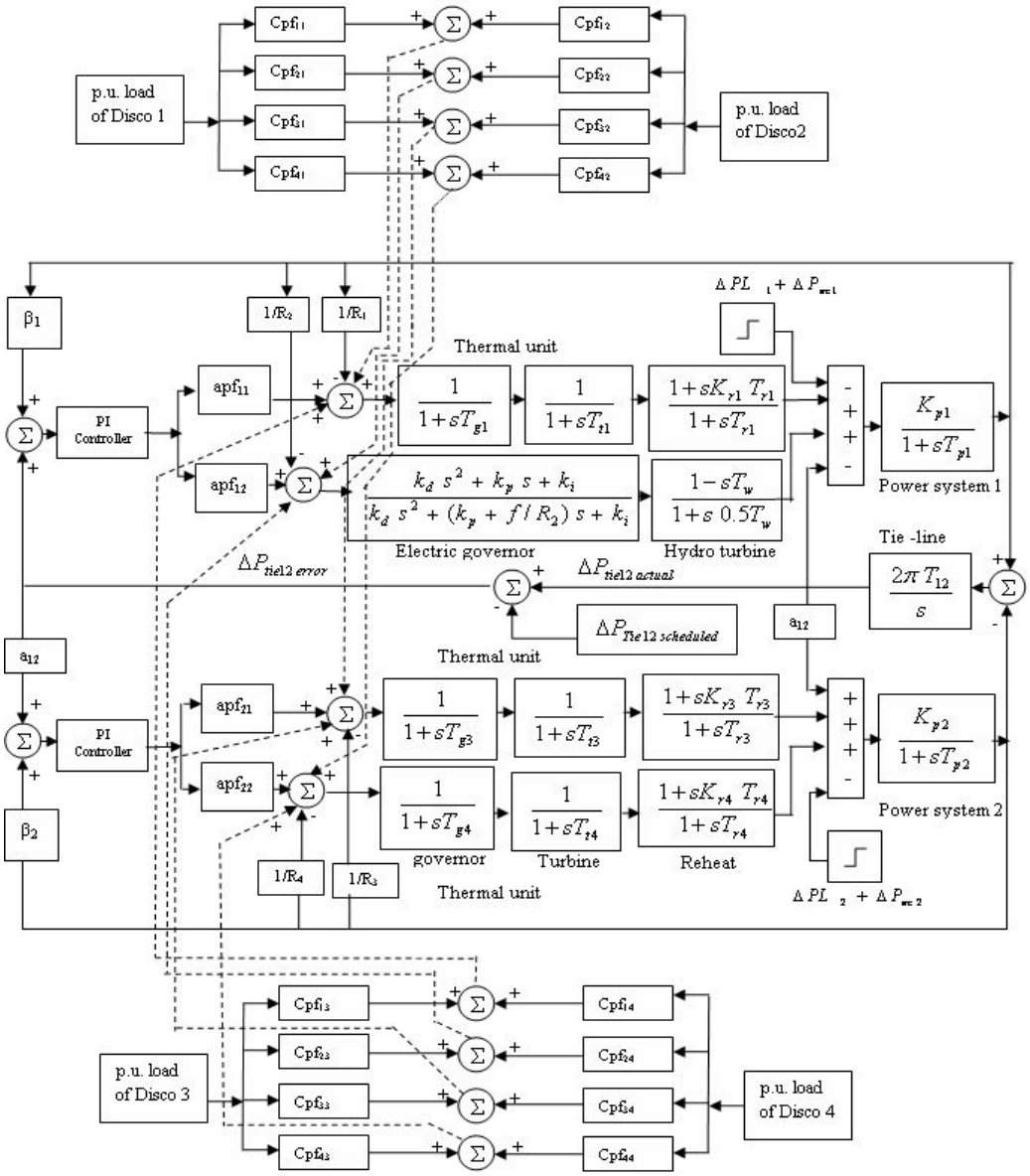

Figure-2: Linearized model of a two-area hydro-thermal restructured power system considering hydro electrical governor

III. DESIGN OF PI CONTROLLERS USING BFO ALGORITHM

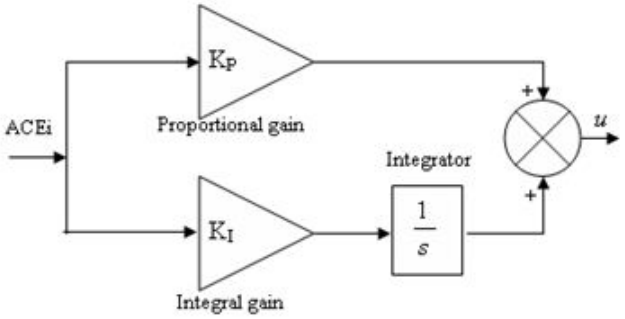

Figure-3: Block diagram of conventional PI controller

Many investigations in the area of automatic generation control (AGC) problem of interconnected power systems have reported over the past six decades. A number of control strategies have been employed in the design of load frequency controllers in order to achieve better dynamic performance. Among the various types of AGC, the most widely employed is the conventional Proportional plus Integral (PI) controller. In this work optimum gain values are tuned based on the settling time of the output response of the system (especially the frequency deviation and tie-line power deviation) and with these gain values the performance of the system is

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analyzed. In this case study it is used as a feedback controller which drives the plant to be controlled within a weighted sum of error and integral of that value i.e. it produces an output signal consisting of two terms one proportional to error signal and the other proportional to integral of error signal. In order to satisfy the above requirements, Proportional plus Integral gains ($K_{Pi,}$ K_{Ii}) in the LFC loop are to be optimized using BFO algorithm. In the present work an Integral Square Error (ISE) criterion is used to minimize the objective function which is defined as follows. The objective function is minimized with help of Bacterial Foraging Optimization Technique.

Where,

$$U_1 = -K_{p1}\ ACE_1 - K_{I1}\int ACE_1 \quad dt$$

$$U_2 = -K_{p2}\ ACE_2 - K_{I2}\int ACE_2 \quad dt \qquad (5)$$

Where, K_p - Proportional gain, K_I - Integral gain, *ACE* - Area Control Error and U_1, U_2 - Control outputs of the respective areas. The block diagram of conventional Proportional-Integral (PI) controller is shown in Fig.3. The relative simplicity of this controller is a successful approach towards the zero steady state error in the frequency of the system. With these optimized gain values the performance of the system is analyzed and various PSR indices are computed.

3.1 Bacterial Foraging Optimization Algorithm

In case of BFO technique each bacterium is assigned with a set of variable to be optimized and are assigned with random values [Δ] within the universe of discourse defined through upper and lower limit between which the optimum value is likely to fall. In the proposed method proportional gain (K_{pi}) and integral gain K_{Ii} (i=1, 2) scheduling, each bacterium is allowed to take all possible values within the range and the cost objective function which is represented by Eqn (5) is minimized. The flowchart for BFO algorithm is shown in Fig 4.

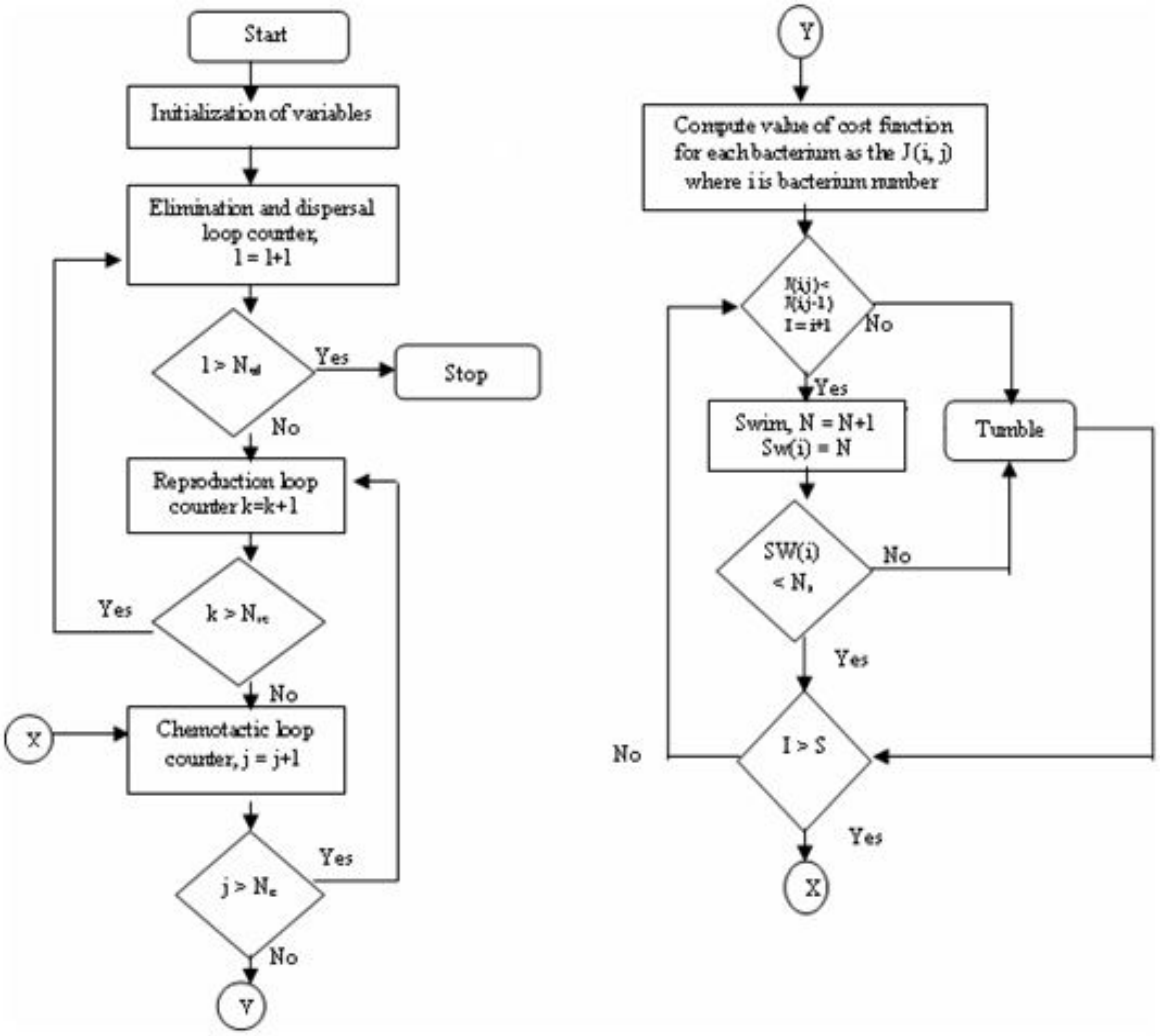

Figure-4: Flowchart for Bacterial Foraging Optimization Algorithm

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IV. EVALUATION POWER SYSTEM RESTORATION INDICES

Power system restoration is well recognized as an important task to reduce the duration of a disturbance that occurs in power systems. The high level strategy of the System Restoration Plan is to restore the integrity of the interconnection as quickly as possible. The system restoration strategies are found closely related to the systems' characteristics. After analyzing the system conditions and characteristics of outages, system restoration planners or dispatchers will select the Power System Restoration (PSR) indices which were obtained based on system dynamic performances and the remedial measures to be taken can be adjudged. In this study two-area thermal-diesel interconnected power system in a restructured environment are considered when the system is operating in a normal condition with Gencos units in operation and is one or more Gencos unit outage in any area. From these Restoration Indices the restorative measures like the magnitude of control input, rate of change of control input required can be adjudged. The various power system restoration indices (PSR_1 , PSR_2 , PSR_3 , PSR_4 , PSR_5 , PSR_6 PSR_7 , PSR_8) are calculated as follows

Step 1: The Power System Restoration Index 1 (PSR_1) is obtained from the ratio between the settling time of frequency deviation in area 1 (ς_{s1}) and power system time constant (T_{p1}) of area 1

$$PSR_1 = \frac{\varsigma_{s1}}{T_{p1}} \tag{6}$$

Step 2: The Power System Restoration Index 2 (PSR_2) is obtained as the ratio between the settling time of frequency deviation in area 2 (ς_{s2}) and power system time constant (T_{p2}) of area 2

$$PSR_2 = \frac{\varsigma_{s2}}{T_{p2}} \tag{7}$$

Step 3: The Power System Restoration Index 3 (PSR_3) is obtained as the ratio between the settling time of tie – line power deviation (ς_{s3}) and synchronous power coefficient T_{12}

$$PSR_3 = \frac{\varsigma_{s3}}{T_{12}} \tag{8}$$

Step 4: The Power System Restoration Index 4 (PSR_4) is obtained as the peak value frequency deviation $\Delta F_1(\varsigma_p)$ response of area 1 exceeds the final value $\Delta F1\,(\varsigma_s)$

$$PSR_4 = \Delta F_1(\varsigma_p) - \Delta F_1(\varsigma_s) \tag{9}$$

Step 5: The Power System Restoration Index 5 (PSR_5) is obtained as the peak value frequency deviation $\Delta F_2\ (\varsigma_p)$ response of area 2 exceeds the final value $\Delta F2\,(\varsigma_s)$

$$PSR_5 = \Delta F_2(\varsigma_p) - \Delta F_2(\varsigma_s) \tag{10}$$

Step 6: The Power System Restoration Index 6 (PSR_6) is obtained as the peak value tie-line power deviation $\Delta P_{tie}\ (\varsigma_p)$ response exceeds the final value $\Delta P_{tie}\ (\varsigma_s)$

$$PSR_6 = \Delta P_{tie}(\varsigma_p) - \Delta P_{tie}(\varsigma_s) \tag{11}$$

Step 7: The Power System Restoration Index 7 (PSR_7) is obtained from the peak value of the control input deviation $\Delta P_{c1}(\varsigma_p)$ response of area 1 with respect to the final value $\Delta P_{c1}(\varsigma_s)$

$$PSR_7 = \Delta P_{c1}(\varsigma_p) - \Delta P_{c1}\ (\varsigma_s) \tag{12}$$

Step 8: The Power System Restoration Index 8 (PSR_8) is obtained from the peak value of the control input deviation $\Delta P_{c2}(\varsigma_p)$ response of area 2 with respect to the final value $\Delta P_{c2}(\varsigma_s)$

$$PSR_8 = \Delta P_{c2}(\varsigma_p) - \Delta P_{c2}\ (\varsigma_s) \tag{13}$$

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V. SIMULATION RESULTS AND OBSERVATIONS

The proposed PI controllers are designed using BFO algorithm and implemented in two type of test system for different type of transactions. The first test consists of hydro-thermal system with mechanical hydro governor and second consists of hydro-thermal system with electrical hydro governor. The optimal solution of control inputs is taken an optimization problem, and the cost function in Eqn (5) is derived using the frequency deviations of control areas and tie- line power changes. The results are obtained by MATLAB 7.01 software and 100 iterations are chosen for the convergence of the solution in the BFO algorithm.

Scenario 1: Poolco based transaction

In this scenario, Gencos participate only in the load following control of their areas. It is assumed that a large step load 0.1 p.u MW is demanded by each Disco in area 1. Assume that a case of Poolco based contracts between Dicos and available Gencos is simulated based on the following Disco Participation Matrix (DPM) referring to Eqn (1) is considered as

$$DPM = \begin{bmatrix} 0.5 & 0.5 & 0 & 0 \\ 0.5 & 0.5 & 0 & 0 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix} \quad (14)$$

$Disco_1$ and $Disco_2$ demand identically from their local Gencos, viz., $Genco_1$ and $Genco_2$. Therefore, $cpf_{11} = cpf_{12} = 0.5$ and $cpf_{21} = cpf_{22} = 0.5$. It may happen that a Disco violates a contract by demanding more power than that specified in the contract and this excess power is not contracted to any of the Gencos. This uncontracted power must be supplied by the Gencos in the same area to the Disco. It is represented as a local load of the area but not as the contract demand. Consider scenario-1 again with a modification that Disco demands. From the simulation results PSR indices are evaluated using Eq (6)-(13) from the dynamic output response and control input deviations of the proposed with two test system is shown in Table 1 and Table 2 respectively (case 1- 4).

Scenario 2: Bilateral transaction

Here all the Discos have contract with the Gencos and the following Disco Participation Matrix (DPM) referring to Eq (1) is considered as

$$DPM = \begin{bmatrix} 0.5 & 0.25 & 0.5 & 0.4 \\ 0.2 & 0.25 & 0.2 & 0.2 \\ 0.0 & 0.3 & 0.2 & 0.25 \\ 0.3 & 0.2 & 0.1 & 0.15 \end{bmatrix} \quad (15)$$

In this case, the $Disco_1$, $Disco_2$, $Disco_3$ and $Disco_4$, demands 0.15 pu.MW, 0.05 pu.MW, 0.15 pu.MW and 0.05 pu.MW from Gencos as defined by cpf in the DPM matrix and each Gencos participates in LFC as defined by the following ACE participation factor $apf_{11} = apf_{12} = 0.5$ and $apf_{21} = apf_{22} = 0.5$. The corresponding PSR indices are calculated using Eq (6)-(13) from dynamic output responses and peak value of control input deviations of the proposed test system are shown in Table 1 and Table 2 (case 5- 8). Apart from the normal operating condition of the test systems few other case studies like outage generating unit in any area and uncontracted power demand in any area during outage the corresponding Power System Restoration Indices are calculated and are in Table 1 and Table 2 (case 9- 12).

Table 1: PSR Indices for hydro-thermal power system considering mechanical hydro governor for different types of case studies

Test system	PSR indices based on Settling time (ς_s)			PSR indices based on Peak over/ under shoot (M_p)			PSR indices based on control input deviation (ΔP_c)	
	PSR_1	PSR_2	PSR_3	PSR_4	PSR_5	PSR_6	PSR_7	PSR_8
Case 1	1.345	0.967	48.12	0.565	0.438	0.165	0.091	0.041
Case 2	1.748	1.084	49.28	0.868	0.567	0.221	0.186	0.052
Case 3	1.647	1.524	51.14	0.592	0.587	0.112	0.136	0.131
Case 4	1.978	1.874	59.36	0.867	0.744	0.165	0.195	0.124

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Case 5	1.025	0.987	48.76	0.669	0.588	0.051	0.144	0.091
Case 6	1.487	1.078	49.37	0.863	0.742	0.125	0.211	0.096
Case 7	1.696	1.571	50.97	0.891	0.761	0.157	0.158	0.142
Case 8	1.971	1.645	68.44	0.957	0.775	0.167	0.227	0.183
Case 9	1.896	1.823	60.58	0.887	0.852	0.187	0.181	0.172
Case 10	1.972	1.848	62.36	1.198	0.887	0.191	0.188	0.176
Case 11	1.925	1.991	65.22	1.051	1.031	0.182	0.195	0.181
Case 12	1.993	1.901	68.14	1.623	1.387	0.198	0.199	0.194

Table 2: PSR Indices for hydro-thermal power system considering electrical hydro governor for different types of case studies

Test system	PSR indices based on Settling time (ς_s)			PSR indices based on Peak over/ under shoot (M_p)			PSR indices based on control input deviation (ΔP_c)	
	PSR_1	PSR_2	PSR_3	PSR_4	PSR_5	PSR_6	PSR_7	PSR_8
Case 1	1.281	0.942	45.63	0.551	0.416	0.152	0.085	0.035
Case 2	1.563	0.994	46.14	0.843	0.523	0.201	0.182	0.045
Case 3	1.345	1.269	49.09	0.586	0.564	0.109	0.123	0.112
Case 4	1.736	1.592	56.67	0.851	0.723	0.153	0.181	0.113
Case 5	0.956	0.922	42.59	0.657	0.583	0.043	0.133	0.083
Case 6	1.289	0.959	43.54	0.853	0.732	0.113	0.204	0.092
Case 7	1.412	1.241	47.78	0.881	0.753	0.146	0.145	0.121
Case 8	1.625	1.612	57.69	0.856	0.804	0.161	0.173	0.153
Case 9	1.811	1.682	58.71	1.036	0.856	0.177	0.179	0.159
Case 10	1.725	1.894	62.65	0.956	1.021	0.179	0.181	0.164
Case 11	1.945	1.881	63.87	1.489	1.354	0.183	0.194	0.173
Case 12	1.625	1.612	57.69	0.856	0.804	0.161	0.173	0.153

5.1. Power System Restoration Assessment

The focus in this paper for restoration planning in advance can help operators to assess the feasibility of restoration steps and to plan restoration sequences.

(i) If $1.0 \le PSR_1, PSR_2 \le 5$ and $40 \le PSR_3 \le 50$, then the system subject to a large steady error for step load changes. The integral control actions are required based on the performance criteria such as ACE must be equal to zero. Integral controller gain of each control area has to be increased causing the speed changer valve to open up widely. Thus the speed- changer position attains a constant value only when the frequency error is reduced to zero.

(ii) If $PSR_1, PSR_2 \ge 5$ and $\varepsilon_3 \ge 50$ then the system required more amount of distributed generation requirement is needed and the FACTS devices are needed to improvement tie-line power oscillations.

(iii) If $0.5 \le PSR_4, PSR_5 \le 1$ and $0.15 \le PSR_7, PSR_8 \le 0.2$ then the system required the stabilization of frequency oscillations in an interconnected power system. The conventional load-frequency controller may no longer be able to attenuate the large frequency oscillation due to the slow response of the governor for unpredictable load variations. Fast-acting energy storage systems having storage capacity in addition to the kinetic energy of the generator rotors is advisable to damp out the frequency oscillations.

(iv) If $0.05 \le PSR_6 \le 0.15$ then the FACTS devices are needed to improvement tie-line power oscillations..

(v) If $PSR_4, PSR_5 \ge 1$, $\varepsilon_6, \varepsilon_{14} \ge 0.15$ and $PSR_7, PSR_8 \ge 0.2$ then the system is vulnerable and the system becomes unstable and may result to blackout.

VI. CONCLUSION

The PI controllers are designed using BFO algorithm and implemented in two area hydro thermal interconnected power system for different types transactions. The effectiveness of the proposed method is tested in a two-area deregulated power system for a wide range of load demands and disturbances under different

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operating conditions. This BFO Algorithm is easy to implement without additional computational complexity, with quite promising results and ability to jump out the local optima. From the simulated results it is observed that the system output dynamic responses have improved a lot when the interconnected system comprising of electrical governor in the hydro power system in terms of peak over/under shoot and settling time of frequency deviations of both area and tie-line power oscillations. Moreover Power System Restoration indices are calculated for two-area Hydro-thermal interconnected power system which highlights the hydro power plants with mechanical governor requires more sophisticated control for a better restoration of the power system output responses and to ensure improved PSR indices than that of the interconnected system having hydro plant with electrical governor. In these PSR indices can be utilized to help system operators in real time by suggesting relevant actions to be taken up to completely automate the power system restoration.

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