

# CO-OPERATIVE PERSPECTIVE

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**VAIKUNTH MEHTA NATIONAL INSTITUTE  
OF CO-OPERATIVE MANAGEMENT**

**SAVITRIBAI PHULE UNIVERSITY ROAD, PUNE 411 007. INDIA**



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- (c) to furnish library documentation of articles on co-operation/management and allied subjects derived from various sources of publication;
- (d) to give glimpse of training activities of the Institute to build up trained manpower for the co-operative movement; and
- (e) to provide opportunity to the readers and specially ex-trainees to exchange experience through feature 'Readers' forum'.

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# Co-operative Perspective

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## **HUMAN RESOURCE DEVELOPMENT IN COOPERATIVES: KEY TO SUCCESS OF THE MOVEMENT**

**Tara Sharma\***

Human Resource Development (HRD) refers to vast field of training and development provided by the organisation to increase skills, knowledge, abilities and education of their employees after he/she first hired and it also known as training and development. Human resource is an active resource of an organisation. Other resources remain inactive unless there is competent person to utilize the available resources for production and services. Human brain has limitless power to think and act in productive way. So, competent and qualified human resource is key factor of organisational success. In this regards HRD plays a vital role. The people become human resource only when they competent to perform organizational activities. So, HRD is an integral part of Human Resource Management which is more concern with training and development.

HRD is needed by any organisation that wants to be dynamic and growth oriented or to succeed in fast changing environment. Organisations can become dynamic and grow only through the competencies and efforts of their human resources. Sir Friedrich Nicholson (1895) whose immense report led to the introduction of the cooperative movement in India wrote as follow about the importance of human resource in cooperatives, "What is really wanted is the advent of men of zeal, enthusiasm, devotion, perseverance and labour to solve the difficulties and the problem not on paper but in actual practice..... There can be no higher honour for any men then to achieve the role Schulze or Raiffeisen of India and the possibility of filling that role is within the power of hundreds of men". For effective utilisation of human resource, planned development of the country M.K. Gandhi had rightly described in 1947 on the threshold of independence in the following words, "any plan which exploited raw materials of the country and neglected the potentially more powerful manpower would never bring about human equality or make the nation really happy and prosperous".

In 1928 the Royal Commission on Agriculture in India had also observed that, "the future of cooperative movement depended on the zeal and efficiency of honorary workers". Altogether there is general acceptance of the need and value of human resource development for the success of cooperative movement. Consequently cooperatives sector have unsatisfactory human resource management functions. Neither member is well informed nor well organised to take up economic ventures nor do the cooperative organisations have scientific selection, salary promotion and other facilities for their employees. As a result, most of the economic ventures in cooperative sector yield very less return. Hence, there is a need to adopt human

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resource development strategies by the cooperatives.

**Human Resource Development:** Human Resource in Cooperatives can be defined as the total of human potential that cooperatives dispose of. The objective of HRD in cooperatives is to build human competencies, to build a climate and to improve members and employee satisfaction with work, i.e. 'competency development', 'climate building' and 'innovation development'. Thus HRD is the process of increasing knowledge, skills, attitude and capacity of the persons in a cooperative organisation. Cooperative organisations need HRD approach in all areas of development and at all levels, beginning from grass root level primary societies to upwards. The lifeline of cooperatives remains not on capital, but on the enlightened participants of the organisation. It is joint responsibilities of members, leaders and employees.

### **Needs and Importance of HRD in Cooperative Sector**

Human resource is needed to develop as per the change in external environment of the organisation. Hence it helps to adopt such changes through development of existing human resource. The importance can be explained as under:

- HRD develops competent human resource for efficient and effective utilisation of all human resource attached with cooperative sector i.e. 1,03,509 members in almost 3610 cooperatives.
- It helps to bring modernisation, diversification, growth and professionalisation in cooperative sector.
- It creates opportunity for career development to members, Board of Directors (BODs), women and youth in cooperative sector.
- Trained employees are more committed for improving systems, services, quality of goods, productivity and overall image of cooperative.
- When people are well trained they make optimum use of resources by adopting improved technology, innovations and creativity. They show higher degree of commitment in workplace which ultimately lead to job satisfaction.
- HRD develops necessary skills and abilities required to perform organisational activities.

- It helps to bring better coordination among different sectors and tiers of cooperatives. To established the spirit of mutual help, cordial relationship among members, BODs and personnel of cooperative sector.
- It also leads to improve the standard of living of the members and employees. This leads to greater organisational effectiveness.

Hence, HRD is a conscious and proactive approach concerned with behavioural knowledge and well integrated system and focuses on all round development of human resources.

### **Problems in Developing Human Resource in Cooperatives**

The implementation of HRD programme is very important and essential for growth, survival and stability, but there are economic, social, cultural and legal problems which interfere the growth and progress of HRD programmes in Cooperatives. The main problems are listed below:

- Lack of interest of organisation
- Due to weak finance base, cooperative sector are not able to attract, retain qualified, trained and committed personnel
- Lack of personal and career growth
- Lack of clear understanding of the organisational goals by various levels of employees as well as by the members of cooperatives
- Rapid change in environment technological, political and economic in which cooperative find difficulties to adjust with time
- Inadequate facilities of education and training with cooperatives in comparison to number of persons to be educated & trained
- Absence of well defined personnel policies in cooperative such as:
- Manpower planning
- Lack of scientific and systematic procedure of recruitment and selection
- Lack of career planning and promotion schemes



- Lack of social security benefits- Inadequate provision of education and training programme
- Salary and wage structure
- Weak information planning mechanism
- Lack of illiteracy, poverty, motivation, lack of cooperative education, traditional ideology, lack of interest in bringing change in quality of life, poor image of cooperative, negative attitude towards cooperative, feeling of dependency, etc. are some of the psycho-social factors prevalent in rural masses which also obstruct the human resource development process in cooperatives.

To conclude, it may be said that cooperative is people's organisation and application of HRD strategy as a package will go a long run in transforming the cooperative system as a whole. But it requires developmental support by the government, introduction of professionalism in the cooperative management, increasing and greater role of cooperative development agencies including apex cooperative federations. Apart from above mention issues, further may consider ways and means to develop appropriate technique for HRD including adequate and effective training and management systems for non-officials for professionalisation in management, incentives and career development so that the experienced, skilled and trained personnel do not leave cooperative organisations, measures for strengthening and restructuring the cooperative education and training arrangements. For greater efficiency, to establish work environment and to increase output and means and ways to prepare 'Human Resource Policy', for adoption by different level and types of Cooperatives with suitable modifications to suit the local needs. Only such changes in HRD can enable the cooperatives to fully exploit all possible resources at optimal levels. I sincerely hope that holistic application of the recommendations will bring expected results.

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**MANAGING CHANGE MANAGEMENT**

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**N. K. Jain\***

Any organization, big or small, which has been in existence for a reasonable time, needs changes in order to be in line with others- in competition and efficiency. Obviously, for this purpose the chief executive officer needs to scan the environments and foresee the changes in terms of work processes and the management processes. As we say in the modern management theories that the most effective management is done by walking around. Merely because the organization is running in profits or the product is selling does not mean everything is fine. The natural growth of the organization will be possible when it is able to keep pace with other organization in a competitive and efficient manner. The chief Executive needs to keep a watch constantly on the developments taking place in the business environments, trends in the customers' needs, efficiency of its work force, technological innovation taking place in the industry and its possible impact on the organization so as to decide consciously about the change.

Obviously, this does not contemplate cosmetic changes. It means the overall changes in its vision, mission, work processes and the management processes. It has to contemplate involving every body in the organization from top to bottom irrespective of their levels in the work force or the management. Such a change will have to be well conceived covering all aspects/steps and must ensure the whole hearted cooperation from all. This is easier said than practice. No one welcomes change unless he is forced to do so or when he realizes the utmost need for his survival. Over the period of time, everybody gets used to a particular working style and feels comfortable in it. He will consider any forced change, a sort of aggression from anybody who wants him to change unless he is convinced by reason or need. Willingness is, therefore, the key to the success of the change.

A question arises as to who should initiate such a change in the organization. If it is initiated by some one lower in the ladder, there is no possibility of success. One needs to convince people about the need and the manner in which this has to be affected. In all possibilities, the people in position will turn down the proposal as they don't foresee the need. Hence, if any meaningful change has to be brought about, it has to be initiated at the Top only with due consultation with some of the people in position who are listened to with respect by every body in the organization and who are in a position of opinion leaders.

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This process of change is being known by different names. Some call it Change Management (CM), while others call it Managing Change (MC). Yet others call it Reengineering Change (RC). A few call it Managing Change Management (MCM). The focus should be on successfully bringing about the desired change not in the organization but in ourselves at the appropriate time smoothly. It is often confused that the change is in the organization but it has to be in the people who are in the organization. That is why it becomes difficult as they resist any change. Further people feel that change would mean curtailment of workforce as invariably the change promotes cost effectiveness to be more competitive. Therefore, the success of change will depend on the following factors:

- a. Change has to be need based. It should not be whim based.
- b. Change has to be effected not in part or selectively. It has to be comprehensive or should cover larger portion of the activity so as to succeed.
- c. Change should mean redefining the management's role in the changed circumstances and the work of the people.
- d. Change should take everybody into confidence based on the data /information based on SWOT analysis of the industry and the place of the organization in that business world.
- e. Change strategy should include qualitative and quantitative aspects both. It should not be lop sided in itself either to focus on quality alone or the quantity alone. In addition, it should be able to outline the future picture of the organization and people at a future date.
- f. Change should not be viewed by the affected people as increasing the productivity by reducing staff. No doubt, in some situation this can happen but in that case, the people should be able to correlate the reduction as the natural consequence of the efficiency. Even in that case also, management should find alternative work for the surplus staff rather than showing them the gate.
- g. Change can not be static in its implementation. It should be flexible enough to be reviewed in the light of experience gained in its implementation and showing its willingness to revise if the need arises.
- h. Change is not something a one time affair. It has to take place continuously. It should become a way of life for all concerned. Therefore it is essential to win their confidence and willing participation. They need to be listened to carefully lest they develop indifference to the whole exercise. All their doubts need to be clarified and useful suggestions to be considered by the top management. The management must answer truthfully all the questions and should demonstrate action in line with the answers given. People should be

able to see for themselves that what has been promised as a part of change plan is being implemented in the same manner.

- i. Change should not be a rhetoric plan. It should be implemented. It should prescribe action appropriately.
- j. Change should motivate people to participate rather than precipitate the exercise.

The Chief Executive Officer proposing the change strategy is in the most difficult situation as no two industries have things in common. He can't borrow the scheme from others and implement. The scheme has to be specific to the organization. He has no past precedence to go by. He has to find all the answers. He has to take the entire responsibility for implementation and success. He has no guided or time tested formulae to adopt. He has to be innovative, imaginative and practical with a fore for success. He must be equipped to carry people along and seek their cooperation by suitable motivation strategy. He has to be honest in his dealings and should be transparent in his action and approach.

Change is inevitable and must be expected and willingly accepted. The management guru, Peter Drucker has gone one step ahead when he said very aptly that every organization has to be prepared to abandon every thing it does. In other words, no organization can escape from change. Willy-nilly it has to come. If the CEO is really smart, he will sense the need much earlier otherwise the circumstances will force people to do so in order to reverse the ill effects of prevailing situation which may be due to wars, political upheavals change in fashion, change in environments, and change in technical innovations.

It is a not a fact that change is always resisted by the lower echelons of the organization. Even the senior management is equally afraid of the change for obvious reasons though out worldly they show themselves on the side of the CEO. These reasons could include fear of loosing control. They are equally concerned about loosing their importance in the organization which may get amended in the light of the changed strategy. They also fear the failure of the change policy as there is no preceding experience of the strategy and it may not give the desired results. They also apprehend that they may have to share the powers with others as change contemplates delegation of authority and responsibility. Therefore, many a times, they may go apparently with the management policy of change but inwardly they sabotage the implementation or create confusion in the minds of the subordinates. This situation is more dangerous. The CEO has to combat double risk of satisfying the subordinates and colleagues respectively. That is why, even at the conceptual stage itself, he must thoroughly discuss with his immediate colleagues and seek their unfettered cooperation and trust in the change strategy.



Discussing the issue of change, a very paradoxical statement is made. It is said "the only way to gain control is to give up". Johnna Torsone is quoted as saying "Giving up power is actually having it. You do it first yourself". Yet another quote, Ralph Waldo Emerson says "A foolish consistency is the hobgoblin of little minds". All said and done the fact remains that change is something which can be accepted or rejected at will. This has to be seen in the right perspective and people will have to be motivated suitably based on facts to accept it for their better future.

As indicated earlier, the management by walking if practiced by the CEO may help him to sense the need for change on the basis of his constant monitoring of the developments in the business world and the need to ensure the continued role to be played by his organization. He must therefore, constantly review the purpose of the organization by looking at the vision and the mission statements. He should examine whether the organization is able to fulfill the expectations indicated in these statements and whether appropriate culture has been developed in the organization and people are able to adhere to them with conviction. If needed, there is no reason to even consider amending the vision and mission statements and introduce appropriate culture to meet those obligations. If the work processes have to be amended to bring about the necessary productivity at a lower cost, he must include these in the change policy. There is no hesitation in changing the management processes to bring about necessary conviction and motivation in the operating staff.

Obviously, managing change is quite a complex activity. It has to be properly assessed and planned before implementation. In fact, it would be worthwhile on the part of the Chief Executive Officer to make some small changes to test people's response as well the effectiveness of the design. This will generate confidence in the CEO as well the staff which in turn will ensure its success.

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**WORLD FIRST SOLAR COOPERATIVE SOCIETY  
DHUNDI SAUR UTPADAK SAHAKARI MANDLI****Kiran Champaneri Setu\***

Chairman of Dhundi Solar Urja Utpadk Sahakari Mandali, Laxamanbhai Parmar said, "We are small farmers, we took the risk as we believe in cooperative model like successful Amul. Earlier, farmers spent about Rs. 750 per day on fuel to electric pumps. Many of them gave up on using pumps as it required huge money."

Pravinbhai Paramar, Secretary of Dhundi Solar Urja Utpadk Sahakari Mandali is formed last year in February 2016 in Dhundi village district of Kheda said that monthly income of 9 members of the society, will now increase by nearly Rs. 4,500/- thank as to solar power plants installed in their farms by the International Water Management Institute (IWMI). The cooperative society has been registered at Registrar of Cooperative Society, Government of Gujarat in District Registrar cooperative society Keda at Nadiyad on date 16/2/2016 and registration no. is 13382. Our society get per unit Rs. 4.63 from Madhya Gujarat Vij Company Limited (MGVCL), in addition International Water Management Institute (IWMI)-Tata program and Climate change, Agriculture and Food Security program will offer Rs.1.25/unit as Green Energy Bonus and another Rs.1.25/unit as groundwater conservation bonus, taking the total pay out per unit to Rs.7.13. In May 2016, Dhundi cooperative society received first payment for solar energy sales. And by December 2016, the cooperative society had earned more than Rs.1,60,000 from energy sales.

After conducting a successful pilot project of connecting farmers with the grid at Anand district of Gujarat, the International Water Management Institute (IWMI) has now assembled six farmers of Dhundi village in Kheda district of Gujarat for a solar power cooperative society. The village did not have access to the agricultural grid. This meant that the farmers here used expensive, noisy, and polluting diesel pumps to pump water out of the ground to irrigate their crops. Diesel pumps were replaced with grid connected solar pumps, installed meters to record the energy, entered into an agreement with the local distribution utility Madhya Gujarat Vij Company Limited (MGVCL) to buy back any excess power at the rate of Rs. 4.63/kWh. Nine farmers opted into the scheme — six farmers with 5 HP pumpsets and three farmers with 7.5 HP pumpsets.

The farmers paid roughly 20 per cent of the price of the pump, while the remaining capital came from the research grant. While states like Karnataka have announced similar plans, the difference in this pilot project is that farmers have been brought together in the form of a cooperative. Farmers now pool their excess power and sell this to the utility, instead of each farmer having an independent agreement with the

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discom. Having been trained on use of solar water pump and how to earn from connecting surplus power from it to the grid, these farmers have come together to form a solar cooperative society named Dhundi Saur Urja Utpadak Sahakari Mandali or Solar Pump Irrigators Cooperative Enterprise (SPICE).

"It is for the first time that someone has set up solar cooperative society. We showcased our pilot project to these small farmers to help them understand that this could be a new mode of earning which eventually led to formation of the society", Tushar Shah of IWMI said.

State discom Madhya Gujarat Vij Company Limited (MGVCL) and Gujarat Energy Research and Management Institute (GERMI) are also supporting IWMI for this project. With the trial run of power supply to the grid being completed, farmers have begun supplying surplus power from solar pumps on commercial basis to MGVCL at the rate of 4.63 per unit. The cooperative society members being small farmers, IWMI had supported them financially for purchase and installation of pumps and solar panels. The institute has so far funded about 40 lakh in the project.

Tushar Shah of IWMI said, "Solar pump costs are not affordable for small farmers so we decided to provide funds to them. We have installed 5kw, 8kw and 10.8 kw solar water pumps in Dhundi village. However, we will not add more funds and would rather go for the government's schemes for solar water pumps when we induct new members in the solar cooperative society." IWMI has also decided to showcase this model to other parts of Gujarat by inviting farmers. MGVCL has signed an agreement with the society to purchase surplus power. It is also helping the society connect with the grid. SPICE is expecting to supply about 250 units power a day to the grid.

MGVCL official said "We have signed a power purchase agreement with the farmers of the solar cooperative society at the rate of 4.63 per unit. This is not the end, if more farmers join, we will connect them also with the grid as part of the agreement." Through the society, farmers are hoping to bring down costs as well as earn almost double through sale of surplus power. The farmers at Dhundi are small farmers with average landholding of only one acre. Each farmer spends close to 20,000 annually on diesel for irrigation.

In-charge of the project, P.Raghu said "With Solar Pump Irrigators Cooperative Enterprise [SPICE], the farmers will not only save the costs on diesel but will also be earning close to 40,000 per annum from sale of solar power."

Gujarat Energy Research and Management Institute [GERMI] is providing technical support to the society and educating farmers about operation of the pumps and connection with the grid. According to IWMI, the local utility will also save on future subsidy of around 50,000 per annum per farmer which they would have incurred had these farmers gotten electricity connections instead of solar pumps.

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Considering that India has close to 15–20 million electric pumps which annually absorb 60,000 crore of farm power subsidies to earn a meager income, the idea of Solar Pump Irrigators Cooperative Enterprise [SPICE] offers wide ranging appeal. A community-based approach reduces the chance of any one farmer stealing power from his neighbour's grid. Cooperatives are self-regulatory in nature.

The pilot at Dhundi, Gujarat, presents a feasible solution to reduce the agricultural electricity consumption from the grid, thus eliminating power subsidies that are inherent to India's power sectors. Every unit of electricity that is evacuated onto the grid will mean that groundwater remains under the ground. The key challenge would be to arrive at the right number for the buyback of power — a number that is acceptable to both the farmer and the utility. In a scenario of rapidly falling solar tariffs, this is indeed a challenge. Nevertheless, Dhundi demonstrates that small yet simple solutions can go a long way in solving India's power and water problems through cooperative.

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**ECONOMIC EMPOWERMENT THROUGH MARKETING OF WOMEN SELF HELP GROUP PRODUCTS IN STATE OF TAMIL NADU: AN EMPIRICAL ANALYSIS****P.Amuthavalli\*****B. Tamilmani\*\*****ABSTRACT**

SHGs have been playing a vital role in poverty alleviation and economic amelioration of the rural women masses in India. As such, it has become ray of hope for millions of disadvantaged and non-bankable sections of the society. SHGs have not only practiced the micro savings, micro lending among the members but also made them as business entrepreneurs individually as well as collectively. They are regarded as proven model in addressing the economic and social issues of women and have been a cause for empowering them. One such instance of the members of SHGs of Tamil Nadu have ventured into different forms of business activities, namely production, trading and service, and how these members attained economic empowerment through marketing of SHGs products is all about the research paper based on the empirical evidence.

**Introduction**

Self Help Groups (SHGs) have been playing a vital role in poverty alleviation in rural India for about two and half decades. A large number of people of small means and disadvantaged sections particularly women in various parts of India are members of SHGs and are actively engaged in savings and credit, as well as in income generating activities. The downtrodden focus of the SHG is the most prominent element and offers the women members a chance to create some control over capital, albeit in very small amounts. The SHG system has proven to be very relevant and effective in offering the women members the possibility of getting away from exploitative tendencies and isolative practices.

SHG is the brainchild of Grameen Bank of Bangladesh, which was founded by Prof. Mohammed Yunus of Chittagong University in 1975. The concept of SHG punned its faith on the principle of "for the people, by the people and of the people".

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The micro-credit movement has brought about radical changes among the rural women-folk, who are being considered as non-bankable, disadvantaged and have been neglected for the long- years. In course of progress, the SHG members have plugged into entrepreneurial activities and have started marketing of SHGs products for enhancement of their economic conditions. As such the dynamics of SHG has proved as tool to ensure empowerment in their life. Empowerment is a process of change by which individual women or group members gain power and the ability to take control over their lives. It involves access to resources, resulting in increased participation in decision-making and bargaining power and increased control over benefits, resource and own life, increased self-confidence, self esteem and self respect, increased well being.

In this regard, it is pertinent to find answers for some of the key questions namely: what is the socio economic base-line of SHG women respondents? What are the products that are being dealt by SHG women entrepreneurs? What marketing mix practices are being adopted by the SHG women entrepreneurs to augment the sales? To what of level the status of SHG women entrepreneurs have improved especially in terms of this economic empowerment? These are all but a few questions which need to be studied systematically and hence the sort of research work is needed.

#### **Review of Literature :**

Some of the recent studies have been reviewed to have further understanding on the theme methodological aspects, findings and to find out the research gap to be plugged through the present work.

**Saravanan. M (2016)**, his study concluded there is evidence of increased household income. Standard of living for the program participants have increased and also the food security is much more for the program clients. Microfinance is playing a significant role in alleviate poverty and rural development. Since women are the sole family caretaker, proper emphasis should be given to the rural women and for empowering the rural women finance is required. Microfinance to the rural SHGs is a way to raise the income level and improve the living an economic one-gaining more self-confidence is often a more lasting achievements that forms the basis for social and economic improvements.

**Vinodhini.R.L and Vaijyanthi. P, (2016)**, in their study findings on social organizations have been presented. The key reasons for the success of SHG are its link with the poor people, its innovative practices, its capacity to enable people's participation in development and trust building at different levels between stakeholders. SHGs also help in the financial status of the households. They have developed self-confidence and independence among rural women, which in turn increased the livelihood of the rural people.



**Rosary Ramona Fernando. A, and Azhagaiah. R (2015)**, in their study on "Economic Empowerment of Women through Self Help Group", found that the effect of becoming members in the SHGs in respect of economic empowerment, and enabled the women to have a significant improvement in the economic empowerment.

**Yoginder Singh(2013)** done a study on "Effect of Self Help Groups in Economic Empowerment of Rural Women in Himachal Pradesh", to evaluate the nature of business carried out by women through SHGs along with its performance and its impact on economic empowerment in rural areas.

**Reji(2013)**, had studied on "Economic Empowerment of Women through Self Help Groups in Kerala", found that majority of the respondents' income after joining SHG was higher than the income before joining SHG in both Ernakulam and Idukki districts.

**Uma.G, and Fatima Baby.D (2013)**, in their study on "Economic Emancipation of Women through SHGs in Thanjavur District-An Analysis", measured the changes brought about in the level of income, employment, expenditure, savings and borrowing after becoming members in the SHGs.

**Thippa Reddy. R and Dhananjaya (2013)**, in their study on "Women empowerment through SHGs Production and Marketing Activities: A Case Study of Davangere District" found that the income of the women has increased after joining the SHGs and the economic activities of SHGs were quite successful in developing women empowerment in rural areas.

**Murali.P(2011)**, in his work on "Women Entrepreneurship through Self Help Groups" has analyzed the reaching of micro credit in the remote parts. Therefore, a micro credit through SHGs would be a harbinger of the overall development of the socio economic development of the rural poor.

**Vijaya. R (2011)**, in her doctoral work on "Marketing Strategies of Self Help Groups- A Study of Micro Enterprises in Karnataka", has recommended for marketing information facilitation centre for the promotion of marketing of SHG products.

**Tamilmani. B (2009)**, in his research study on "Rural Women Micro Entrepreneurs: An Empirical Study on Their Social profile, Business Aspects and Economic Impact", found that there was a positive shift in the economic development witnessed in daily turnover of the business.

**Subashini Muthukrishnan (2005)** in her paper "Effective marketing strategies for women self help groups" stated that SHGs have to decide on the product and on price vis-a vis its cost of production, returns and the price of its competitors are selling the product, credit time, marketing infrastructure available and the related aspects.

Perusal of the recently available literature on women empowerment confirms that no comprehensive studies are available to assess the empowerment of women through marketing of SHG products. By keeping this in view the above stated problems, knowledge and research gap, it is high time to probe on the issue of women empowerment through marketing of SHG products through empirical research.

**Objectives :**

The study has been carried out with the following objectives:

- i. To study the socio economic profile of the Self Help Group Women Entrepreneurs;
- ii. To analyze Marketing Mix practices adopted by the SHG women entrepreneurs; and
- iii. To ascertain the economic empowerment status through marketing of the SHG products.

**Methodology :**

It is an empirical study based on primary data to carry out this research work, Multi- stage random sampling was used. There are eight Talukas in the Dindigul District namely Athoor, Dindigul, Kodaikanal, Nilakottai, Vedsandur, Natham, Oddanchatram and Palani. At the first level, four out of eight talukas namely Athoor, Dindigul, Nilakottai and Vedsandur were selected for this study on the basis of the higher number of functional SHG Women Entrepreneurs. From the total number of SHG women entrepreneurs (1411), 24 percent were (340 Women Entrepreneurs) selected randomly for the study purpose. The women entrepreneurs functioning in the SHGs continuously for more than three years were selected as respondents, especially to assess the empowerment impact.

**Analysis and Interpretation :**

This part of exercise covers the analysis of three important aspects namely i). Social profile, ii). Marketing mix practices, and iii). Economic empowerment. The data collected are analyzed with the help of tables in the study. In the present part of the exercise, the profile of social variables of the respondents is presented:



## I) Social Profile

Table - I  
Profile of the Respondents

Age in Years		Name of the Taluks									
		Athoor		Dindigul		Nilakottai		Vedasandur		Total	
No	%	No	%	No	%	No	%	No	%	No	%
Below 25	2	13	7	25	13	42	5	19	3	20	6
26-35	21	23	47	25	13	5	12	19	86	25	45
36-45	46	51	85	44	8	26	48	151	75	22	45
46-55	18	20	46	24	4	13	7	26	75	22	45
Above 56	4	4	0	0.0	2	6	1	4	7	2	4
<b>Level of Education</b>											
Uneducated	5	6	10	5	2	7	1	4	18	5	31
Upto 10th Standard	38	42	46	24	13	42	10	37	107	31	31
Upto 12th Standard	23	25	70	36	8	26	6	22	107	32	32
UG Degree	18	20	42	22	4	13	7	26	71	21	21
PG Degree	5	5	22	12	2	6	1	4	30	9	9
Technical/	2	2	1	1	2	6	2	7	7	2	2
Vocational Course											
<b>Marital Status</b>											
Unmarried	1	1	1	1	0	0	0	0	2	1	1
Married	75	82	180	94	31	100	24	89	310	91	91
Divorced	2	2	3	1	0	0	0	0	5	1	1
Widow	11	13	7	4	0	0	3	11	21	6	6
Deserted	2	2	0	0	0	0	0	0	2	1	1

Type of Family										
Nuclear	77	85	181	95	28	90	26	96	312	92
Joint family	14	15	10	5	3	10	1	4	28	8
Size of Family										
1-3 Members	31	34	64	33	5	16	5	19	105	31
4-6 Members	58	64	124	65	26	84	22	81	230	68
Above 7 Members	2	2	3	2	0	0	0	0	5	1
Religion										
Hindu	80	88	130	68	30	97	27	100	267	78
Christian	10	11	29	15	1	3	0	0	40	12
Muslim	1	1	32	17	0	0	0	0	33	10
Caste										
SC/ST	22	24	57	30	28	90	16	59	123	36
BC	53	58	128	67	2	7	10	37	193	57
MBC	16	18	6	3	1	3	1	4	24	7
Total	91	100	191	100	31	100	27	100	340	100

*Source: Compiled from Primary Data-2016*

The table clearly explains that the age group of the respondents was ranging from less than 25 years to above 56 years. It was also found that 45 percent of the total respondents fall in the category of 36 to 45 years. Regarding educational qualification, found that 32 percent of respondents have studied up to 12<sup>th</sup> standard. The marital status shows that most of the respondents were married (91 percent). On the type of the family, it was found that 92 percent respondents belonged to nuclear families and 68 percent respondents were having a family size of 4-6 members. 78 percent of the respondents were Hindus and 90 percent were found to be Schedule Castes as this constituency is a reserved constituency.

## ii) Marketing mix practices

The essence of marketing is an exchange or a transaction, intended to satisfy human needs or wants. Marketing is an human activity directed at satisfying needs and wants through an exchange process. The marketing practices adopted by the respondents in their micro-enterprises are being described through the marketing



mix popularly known as the 4 P's (Product, Price, Place, and Promotion).

In the study area, the SHG women entrepreneurs found engaged in a variety of business activities broadly classified under i) Production, ii) Trading, and iii) Service sectors. The production activities include: a) *Food Products*- Masala Powder, Wet Idly Flour Making, Papad, Hotel, Fast foods, Snacks; b) *Handicrafts*- Wire Bag, Leather Bag, Toys Industry, Candle Making, Washing Powder Making; c) *Agriculture Related*- Sprout Green Dhal, Flower Collection, Natural Hair Oil, Vegetable Collections, Thatched Thai Making. d) *Animal Husbandry*- Dairy Farming, Goat rearing, Poultry Farming, Ornamental Fish Making, Mutton Stall; and e) *Industrial Production*- Plastic Cup Industry, Coir Industry, Steel cupboard Industry, Mat Making, Bricks Industry and Garment Industry.

The trading sector includes petty shop, grocery shop, medical shops, vegetable shops, flower collection, mobile shops and the list continues. The service sector includes tailoring units, automobile service, dhobi servicer and supply of mineral water.

The pricing practices indicate that the respondents adopt skimming pricing, discriminating pricing, product mix pricing and geographical pricing. With regard to place mix respondents mostly make sales in their native place and nearby towns. Regarding promotional aspects, they make direct sales (no intermediaries) depends heavily on word of mouth, using less vehicles, working on without standardization are the key aspects.

### iii) Economic Empowerment

This being the main part of the study focuses on whether the SHG women entrepreneurs have improved economically through the marketing of goods and services? For measuring the economic empowerment, the following variables were considered.

- a) Occupational Shift
- b) Ownership of House
- c) Owning House-hold Appliance Our Routine Life
- d) Monthly Income Pattern
- e) Livelihood Patterns and Spending Behaviour
- f) Saving Patterns and
- g) Purchase of Assets

- a. **Occupational Shift:** An occupational shift is considered as one of the factors which facilitates for continuous job and sustainable income. Entering into the entrepreneurial activity of marketing, the SHG products and services would amount to occupational shift, which would favour for their growth and development.

**Table - 2**  
**Occupational Shift of the Respondents**

Occupation	Before				After			
	Production	Trading	Service	Total	Production	Trading	Service	Total
House wife	29(13)	18(30)	31(52)	78(23)	0(0)	0(0)	0(0)	0(0)
Cooli workers	162(74)	34(57)	23(38)	219(64)	0(0)	0(0)	0(0)	0(0)
Entrepreneurs	29(13)	8(13)	6(10)	43(13)	220(100)	60(100)	60(100)	340(100)
Total	220(100)	60(100)	60(100)	340(100)	220(100)	60(100)	60(100)	340(100)

*Source: Compiled from Primary data-2017*

It is revealed from the table that 64 percent of the respondents were cooli workers followed by housewives (23 percent). Only 13 percent of the respondents alone had involved in entrepreneurial activities before joining SHGs. But there witnessed a sea-change in the organizational shift after joining SHGs.

**b. Ownership of House:** Owning a house is a symbol of status. The house becomes one of the basic necessities of human beings. Every human being wants to own a house for leading a happy and peaceful life. That is the reason why, owning a house is considered as a parameter for measuring the economic empowerment of the respondents.

**Table-3**  
**Ownership of House by the Respondents**

Nature of House	Before				After			
	Production	Trading	Service	Total	Production	Trading	Service	Total
Rental House	88(40)	22(36.7)	24(40)	134(39.4)	3(1.4)	4(6.7)	3(5)	10(3)
Own House	132(60)	38(63.3)	36(60)	206(60.6)	217(98.6)	56(93.3)	57(95)	330(97)
Total	220(100)	60(100)	60(100)	340(100)	220(100)	60(100)	60(100)	340(100)

*Source: Compiled from Primary data-2016*

It is found from the above table that 61 percent respondents had their own house before taking up marketing activities and the rest 39 percent lived in rental houses. But the situation got changed after joining SHGs and undertaking micro enterprises. The percentage of respondents who lived in rental houses was 39 and it was declined to 3 percent, after taking up marketing activities which indicates a positive sign of



empowerment. In the case, of owned house, there was a shift from 61 percent to 97 percent, after taking up marketing activities.

**c. House-hold Items:** Household appliances like Cooking Gas, Mixer Grinder, Grinder, Television, Refrigerator and the related items, considered important in making houses very smart and comfortable. Now a days the need for these items is much felt to lead life with normal comfort. That too respondents being entrepreneurs need to balance both work and life, need these appliances.

**Table -4**  
**House-hold Items Owned by the Respondents**

Material Possession	Before				After			
	Production	Trading	Service	Total	Production	Trading	Service	Total
Cooking Gas Stove	40(58)	8(12)	21(30)	69(20)	215(64)	60(18)	60(18)	335(99)
Mixer Grinder	126(70)	22(12)	32(18)	180(53)	220(65)	60(18)	60(18)	340(100)
Grinder	74(71)	13(13)	17(16)	104(31)	219(65)	60(18)	60(18)	339(100)
Television	183(62)	55(19)	55(19)	293(86)	219(65)	60(18)	60(18)	339(100)
Refrigerator	1(50)	1(50)	0(0)	2(5)	103(66)	28(18)	26(17)	157(46)
Washing Machine	1(100)	0(0)	0(0)	1(2)	43(72)	7(12)	10(17)	60(18)
Fans	160(61)	51(20)	50(19)	261(77)	212(62)	60(18)	60(18)	340(100)
Computer	1(100)	0(0)	0(0)	1(2)	9(82)	1(9)	1(9)	11(3)

**Source: Compiled from Primary data-2016**

The analysis of table shows that after joining the SHG and undertaking the marketing of SHGs products, the possession of household appliance has increased to greater level. For example, 100 percent of respondents have mixcy, grinder, television and fan; and owing of other items like the refrigerator by (46 percent), washing machine by (17 percent) and computer by (3.2 percent). The analysis reveals that the marketing of SHG products has contributed economically and with that only the respondents had owned household appliances to a greater level.

**d. Monthly Income:** The income earned from marketing of SHG products is considered as an indicator of empowerment. Women who consider that their earnings contribute to a substantial portion of total family income would to be empowered. What is more crucial for empowerment is level of earnings as well as control over earnings. All these factors indicate that income is an important variable whose significance has to be tested.

**Table-5****Average Monthly Income of the Respondents**

Income Classes (Rs)	Before				After			
	Production	Trading	Service	Total	Production	Trading	Service	Total
Upto 1000	38(17)	25(42)	18(30)	81(24)	12(5)	2(3)	3(5)	17(5)
1001-3000	100(46)	5(8)	13(22)	118(35)	18(8)	8(13)	6(10)	32(9)
3001-5000	25(11)	8(13)	13(22)	46(14)	20(10)	13(22)	8(13)	41(12)
5001-10000	29(13)	12(20)	10(16)	51(15)	60(27)	15(25)	20(33)	95(28)
10000 and above	28(13)	10(17)	6(10)	44(12)	110(50)	22(37)	23(39)	155(46)
Total	220(100)	60(100)	60(100)	340(100)	220(100)	60(100)	60(100)	340(100)

**Source: Compiled from Primary Data-2016**

The table indicates that a majority of respondents with 35 percent had the average monthly income category of Rs.1001 to Rs.3000 followed by 24 percent respondents whose income was less than Rs.1000/-.However, after marketing of SHG products the income earnings has increased to above Rs.10000 for 46 percent respondents followed by 28 percent whose income category was Rs.5001 to 10,000.

### **Testing of Hypotheses :**

#### **I) Association between Livelihood Pattern, Spending Behavior and SHG**

To identify the difference in SHG and Livelihood Pattern and Spending Behavior, independent sample 't' test was applied. The study framed the following hypotheses, Ho<sub>1</sub>: There is no significant difference of Livelihood Pattern and Spending Behavior on SHG. The test is given in table -6.



Independent Sample Test:

Table. 6  
Paired Samples Test

Livelihood Pattern, Spending Behavior	Paired Differences							
	Mean	Std. Deviation	Std.Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2 tailed)
				Lower	Upper			
Pair 1 Food Habit and consumption - Pattern of Before. After Joining the SHGs	3.210E4	1.571E4	8.522E2	3.042E4	3.377E4	37.663	339	.000*
Pair 2 Normal Food- Before After-	9.2093	32889.63	1786.319	12723.143	-5695.735	-5.156	338	.000*
Pair 3 Normal Cloth Before After-	3.001E3	3457.260	187.496	2632.667	3370.273	16.008	339	.000*
Pair 4 Government Education Join Before - After	7.158E2	2544.329	137.985	444.466	987.298	5.188	339	.000*
Pair 5 Private Hospital After Expenses Before -	3.032E3	8337.746	452.177	3922.074	2143.219	-6.707	339	.000*
Pair 6 Both - Hospital Expenses Before - After Joining the SHGs	-3.302E3	6.450E3	3.498E2	-3.990E3	-2.614E3	-9.440	339	.000*
Pair 7 Festival Celebration Expenses Before - After Joining the SHGs	-5.162E2	4.550E2	2.4675E1	-5.647E2	-4.676E2	-20.92	339	.000*
Pair 8 Travelling Mode Expenses Before After Joining the SHGs -	-2.824E3	2.619E3	1.420E2	-3.103E3	-2.544E3	-19.8	339	.000*

Source: Compiled from Primary data-2016

Table-6 displays the association between the Livelihood Pattern and Spending Behavior and Self Help Groups comparison before and after joining SHGs revealed that the independent- 't' test values showed significant values for the before and after joining SHGs –Food habit and Consumption Pattern, Normal Food, Quality Food, Government Education, Private Education, Government Hospital, Private Hospital, Both Hospital, Festival Celebration Expenses and Travelling Mode Expenses are statistically significant at 5 percent level. Therefore, the null hypothesis is (Ho1) is rejected because Self Help Groups makes significant difference on all variables.

## ii) Association between Savings Pattern and SHG

To identify the difference in SHGs and Savings Pattern independent sample 't' test was applied. The study framed the following hypothesis, Ho<sub>2</sub>: There is no significant differences between the Savings Pattern on SHGs. The result is given in the table-6.

### Independent Sample Test

Table- 7

### Savings Patterns and Self Help Groups by the Respondents Paired Samples 't' Test

Savings Patterns	Paired Differences							
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Chits Funds Before and After	-3.07E4	4.82E4	2.61	-3.58E4	-2.55E4	-11.733	339	.000*
Pair 2 Jewells Funds Before and After	-4.64E3	1.62E4	8.81	-6.38E3	-2.913E3	-5.272	339	.000*
Pair 3 Vessels Funds Before and After	-5.88E2	4.00E3	2.17	-1.01E3	-1.612E2	-2.710	339	.007*
Pair 4 Life Insurance Before and After	-1.26E4	2.77E4	1.50	-1.55E4	-9.67E3	-8.409	339	.000*
Pair 5 Bank Deposit Before and After	-1.18E3	5.48E3	2.97	-1.77E3	-6.04E2	-4.001	339	.000*
Pair 6 Post office Before and After	-1.89E3	11037.80	598.60	-3074.51	-719.60	-3.169	339	.002*

Source: Compiled from Primary data-2016



Table -7 displays the association between Savings Patterns and Self Help Groups before and after joining SHGs comparison revealed that the independent- 't' test values showed significant values for the variables- Chits Funds, Jewells Funds, Vessels Funds, Life Insurance, Bank Deposit and Post Office are statistically significant at five percent level. Therefore, the null hypothesis is (Ho2) is rejected because Self Help Groups makes significant difference on all variables.

### iii) Purchasing of Assets

To identify the difference in SHGs and the Purchasing of Assets, independent sample 't' test was applied. The study framed the following hypothesis, Ho<sub>3</sub>: There is no significant difference between the Purchasing of Assets and SHGs. The result is given in table-8.

Independent Sample Test:

**Table-8**  
**Purchasing of Assets and SHGs Paired Samples 't' Test**

Savings Patterns		Paired Differences					t	df	Sig. (2 tailed)
		Mean	Std. Devia tion	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Two Wheeler Purchased Before and After Joining the SHGs	-.44	.51475	.02792	-.49609	-.38627	-15.804	339	.000*
Pair 2	Cattle Purchased Before and After Joining the SHGs	-.27	.47069	.02553	-.32080	-.22038	-10.600	339	.000*
Pair 3	Plots Purchased Before and After Joining the SHGs	.00882	.17992	.00976	-.01037	.02802	.904	339	.366
Pair 4	Jewels Purchased Before and After Joining the SHGs	5.50E-1	.504112	.027339	-.60377	-.496223	-20.118	339	.000
Pair 5	House/Extension of Before and After Joining the SHGs	-.41471	.50521	.02740	-.46860	-.36081	-15.136	339	.000

Source: Compiled from Primary Data-2016

The table-8 shows association between the SHGs and Purchasing of Assets comparison revealed that the independent- t test values showed significant values for the variables – Two wheeler, Cattle, Plots, Jewels, House/Extension are statistically significant at five percent level. Therefore, the null hypothesis is ( $H_0$ ) is rejected because Self Help Groups makes significant difference on all variables.

**Suggestions :**

- 1) SHG Bazaar must be created for promoting and marketing of SHG products.
- 2) State and District level exhibition of SHG products must be organized at regular intervals to create awareness.
- 3) Periodical training on product marketing, packing and branding must be given to enhance the entrepreneurial skills of the SHG members.
- 4) All the government departments, schools and educational institutions must be encouraged to have stalls of SHGs micro enterprises products.
- 5) The quality standard certificate for the products prepared by SHGs micro enterprises must be obtained.

**Conclusion:**

Based on the foregone analysis, it is concluded that the respondents after joining the SHGs and taken up the marketing of SHGs products, they have economically empowered particularly in the areas of occupational shift, ownership of house, owning of household items, monthly income, savings pattern and purchase of assets. However, the study of marketing mix practices adopted by the respondents indicates that they still follow the traditional methods of marketing.

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**ROLE OF INFORMATION TECHNOLOGY IN MANAGEMENT OF INVENTORY IN SUGAR FACTORIES OF MAHARASHTRA.**

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**ABSTRACT**

Sugar industry is one of the most important agro-based industries in India and ranks second amongst major agro-based industries in India. The progress of the world is standing on three innovations namely Science, Technology and Management. The Cooperative Sugar Factories has been slow to adopt the use of information technology (IT), despite its potential to improve efficiency of planning and decision making. Especially, Inventory management is a critical management issue for Cooperative Sugar Mills. The present paper discusses the effect of information technology on Management of Inventory in sugar factories of Maharashtra. The study objectives specifically sought to establish the extent of information technology adoption in the sugar factories and determine the influence of information technology on management of Inventory. The study focused on thirty cooperative sugar mills in Maharashtra. The study established that most of the sugar factories had fully adopted the use of information technology in their stores and it had a great impact on inventory operations. Even though most sugar factories were fully computerized it is observed that none of the factories have applied modern inventory control methods. There are no applications of advance IT techniques like ERP, Bar code, RIFD, QR codes or NFC tags.

**Keywords:** Inventory Management, Information Technology, Sugar Factories.

**1.0 INTRODUCTION:**

Inventory management is a critical management issue for manufacturing firms. Inventories are vital to the successful functioning of manufacturing organizations. There are several reasons for keeping inventory. Too much stock could result in funds being tied down, increase in holding cost, deterioration of materials, obsolescence and theft. On the other hand, shortage of materials can lead to interruption of products for sales; poor customer relations and underutilized machines and equipments. Different departments within the same organization adopt different attitude towards inventory. Inventory represents an important decision variable at all

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stages of product manufacturing, distribution and sales, in addition to being a major portion of total current assets of many organizations. In this era of globalization and liberalization, all industries in private sectors have improved their management systems through Information Technology and they have improved their performance as well. But Cooperative sector is lagging behind in Computerisation. Cooperative Sector needs to adopt IT solutions and make appropriate investment in implementation of computerisation so as to stay alive in the competitive market.

Computerisation is initiated in Sugar Factories in late 1980's. In the initial stage computerisation was considered as an enabler and most of the sugar factories handled desktop computers for their correspondence and work related to typing. Subsequently sugar factories realised the importance of computerising various manual work and efforts were put for computerisation of complex and highly repetitive activities which included pay-roll, sugarcane billing, transporter billing etc. In Cooperative sugar factories, especially stores and warehousing are generally a neglected area and therefore was not used as a strategic area for developing competitive advantage.

A lot of research in the sugar industry worldwide was on sugar engineering, natural factors that affect sugarcane production, regulations and policies, subsidies, taxes but there is very little research on the IT adoption and performance in the cooperative sugar factories. The study is important because Cooperative sugar factories which are having very high costs are on the verge of collapse because of mismanagement. This study is an attempt to highlight to major stakeholders the importance of Information technology. This study is confined to examine the effect of information technology on inventory management of cooperative Sugar factories.

## **2.0 RESEARCH METHODOLOGY:**

The study is concerned with determining the effect of information technology on Inventory Management performance of Cooperative sugar factories in Maharashtra. The study investigates the relationship between information technology and inventory performance. The study used descriptive statistics and was able to determine the effect of IT on management of inventory of the sugar factories.

## **2.1 OBJECTIVES OF THE STUDY:**

The major objective of the present study is to examine the effect of Information Technology on Management Inventory in cooperative sugar factories in Maharashtra. However, the specific objectives of the study are:

- A. Establish the extent of information technology adoption in sugar factories
- B. Determine the influence of IT on Inventory Management.

**2.2 HYPOTHESIS:** Based on the framed objectives, the following hypotheses are arrived at:



**A.** Information Technology has played a critical role on the performance of the Inventory Management.

**B.** The use of Information Technology devices has helped the employees on the performance of the Inventory Management.

### 2.3 POPULATION OF STUDY:

Maharashtra has been pioneering state with respect of setting up co-operative sugar factories and the first such factory was set up in 1948. The spread of Sugar Factories is all over Maharashtra but more concentrated in South-Western part of Maharashtra. Among the 100 cooperative sugar factories in Maharashtra, 30 cooperative sugar factories have been selected for the study.

### 2.4 DATA COLLECTION:

Primary data was collected by use of self administered questionnaires and interview schedules. The respondents were EDP managers in the cooperative sugar factories. Along with EDP Manager the store's manager and purchase manager were also interviewed to examine the effect of information technology on the management of inventory in the selected sugar factories.

### 2.5 STATISTICAL TECHNIQUES:

The collected data was edited, coded, tabulated, grouped and organized according to the requirement of the study and then entered into SPSS for analysis. For analyzing the hypothesis one sample test with ANOVA was used.

### 3.0 DATA ANALYSIS AND PRESENTATION:

#### A. Level of Computerisation in Cooperative Sugar Factories:

The level of computerisation was divided into three parts i.e. fully computerized, Manual and partly computerized. The analysis was conducted to study the extent at which Information technology has been adopted by the cooperative sugar factories and how extent did IT has influenced the inventory department.

**Table 3.1**  
**Status of Fully Computerization in Cooperative Sugar Factories**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Moderate Extent	2	6.7	6.7	13.3
	To great Extent	14	46.7	46.7	60.0
	To a large Extent	12	40.0	40.0	100.0
	Total	30	100.0	100.0	-

The status of computerization in cooperative sugar factories has been described in Table No.3.1. The Table shows that three out of 30 factories, 26 factories reported using fully computerized equipment in operations of all departments leading to a percentage of 86.7 while 2 factories reported being fully computerized to a low extent leading to a percentage of 6.7 percent. Most of the department like Share Accounting, Cane Accounting, Harvesting Billing, Transport Billing, Deposit Accounting, Store Accounting & Costing, Financial Accounting, Inventory Management and Sugar & By products sales are fully computerized. It was observed that in spite of computerization in most of the departments in the Cooperative Sugar Factories, the departments still follow both manual and computerization method.

### **B. Adoption of IT in the Inventory department of cooperative sugar Factories:**

**Table 3.2**  
**To What Extent Sugar Factories Adopted the use of IT in your Inventory**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Moderate Extent	19	63.3	63.3	70.0
	To great Extent	8	26.7	26.7	96.7
	To a large Extent	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

The Cooperative Sugar Factories were asked to what extent they had adopted the use of IT in the Inventory. The Table No. 3.2 shows that 19 cooperative sugar factories representing 63.3 percent reported adopting IT in the inventory to a moderate extent, while one factory representing 3.3 percent reported to a large extent. The factories used computers in inventory department to key in data manually for goods inbound and outbound. They reported having VSI or ERP systems in place but integration of IT systems with equipment to aid in space utilization; labour or time was not implemented. Operations in the inventory were largely manual.

**Table 3.3**  
**To What Extent is IT used to Link all the Levels in the Factory**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	7	23.3	23.3	30.0
	To a Moderate Extent	13	43.3	43.3	73.3
	To great Extent	8	26.7	26.7	100.0
	Total	30	100.0	100.0	



The Table No. 3.3 indicates that out of 30 Cooperative Sugar Factories, 13 sugar factories representing 43.3 percent answered to a moderate extent, while 8 sugar factories representing 20.7 percent to a great extent, and while 7 factories representing 23.3 percent to a low extent.

**Table 3.4****To what extent can employees use IT systems in the Inventory**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	8	26.7	26.7	33.3
	To a Moderate Extent	17	56.7	56.7	90.0
	To great Extent	3	10.0	10.0	100.0
	Total	30	100.0	100.0	

The Table No. 3.4 shows that out of 30 Cooperative sugar factories, 17 factories representing 56.7 percent answered to a moderate extent, while 3 factories representing 10.0 percent to a great extent, and while 8 factories representing 26.7 percent to a low extent. From the Table No.3.4 it is clearly states that employees were able to use computer systems in operations.

**Table 3.5****To What Extent Does the Store use any of these Technologies RFID, Barcodes, EDI**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	17	56.7	56.7	56.7
	To a Low Extent	10	33.3	33.3	90.0
	To great Extent	1	3.3	3.3	93.3
	To a large Extent	2	6.7	6.7	100.0
	Total	30	100.0	100.0	

The Table No. 3.5 shows that in spite of all the cooperative sugar factories had inventory management systems, 27 factories representing 90 percent of the factories do not use RFID or barcodes, but one factory reported using RFID for transport billing of sugarcane and few factories use barcodes.

**Table 3.6**  
**To What Extent do you have Inventory Quantities to**  
**Systems Reported Quantities**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	8	26.7	26.7	33.3
	To a Moderate Extent	14	46.7	46.7	80.0
	To great Extent	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

The Table No. 3.6 describes that Inventory accuracy is the variance between perpetual inventory and physical inventory. Stock outs interrupt production and create delivery delays, creates idle time and manufacturing inefficiency. This has been observed in the sugar industry with closure of factories because of lack of cane but the cooperative sugar factories reported that 14 factories representing 46.7 percent to a moderate extent, 6 factories representing 20.0 percent to a great extent. Inventory accuracy can improve other logistical processes thereby reduce costs.

**Table 3.7**  
**Extent Inventory Visibility from Physical Receipt to**  
**User Department Availability**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	9	30.0	30.0	36.7
	To a Moderate Extent	15	50.0	50.0	86.7
	To great Extent	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

The Table No. 3.7 shows that Out of 30 Cooperative sugar factories, 15 sugar factories representing 50.0 percent reported inventory visibility to a moderate extent, 4 factories representing 13.3 percent responded to a great extent and 9 and 2 factories representing 36.7 percent responded to a low and very low extent. Inventory visibility is the ability of a factory to manage inventory in real time with visibility into current inventory locations and levels. This visibility enables a factory to streamline processes related to inventory process.



## C. Influence of IT on Inventory functions:

The second objective was establishing the influence of IT on management of Inventory functions.

**Table 3.8**  
**To What Extent is IT used in handling Inventory Functions**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Moderate Extent	5	16.7	16.7	23.3
	To great Extent	17	56.7	56.7	80.0
	To a large Extent	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

The cooperative sugar factories were asked if Information Technology had any influence on inventory functions like receiving, sorting, storage, picking and transportation of materials. The Table No. 3.8 depicts that 17 cooperative sugar factories representing 56.7 percent reported to be great extent and 6 factories representing 20.0 percent reported to a large extent, 2 factories representing 6.7 percent to a very low extent, and 5 factories representing 16.7 percent responded to a moderate extent.

**Table 3.9**  
**To What extent is IT used in Inventory Decision Making**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	2	6.7	6.7	13.3
	To a Moderate Extent	2	6.7	6.7	20.0
	To great Extent	13	43.3	43.3	63.3
	To a large Extent	11	36.7	36.7	100.0
	Total	30	100.0	100.0	

The Table No. 3.9 shows that out of 30 Cooperative sugar factories 24 sugar factories representing 80.0 percent reported to a large and great extent having an influence on decision making in the inventory management, 2 factories representing 6.7 percent responded to a moderate extent and 4 factories responded to a low and very low extent. It is evident that some of the sugar factories were unable to decide

much in inventory using information technology.

**Table 3.10**

**To What extent is IT influenced on Re Ordering System**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	To a very Low Extent	2	6.7	6.7	6.7
	To a Low Extent	4	13.3	13.3	20.0
	To a Moderate Extent	5	16.7	16.7	36.7
	To great Extent	19	63.3	63.3	100.0
	Total	30	100.0	100.0	

Re Ordering time shows the actual time to fill the store. The cooperative sugar factories were asked if IT had any influence on Re ordering the inventory. The Table No. 3.10 informs those 19 factories representing 63.3 percent responded to a great extent, 5 factories representing 16.7 percent responded to a moderate extent. 6 factories responded to low and very low extent.

**Table 3.11: Descriptive Statistics using Mean and Standard Deviation**

	N	Minimum	Maximum	Mean	Std. Deviation
Fully Computerized	30	1	5	4.13	1.042
Adopted the use of	30	1	5	3.20	.805
IT in your Inventory	30	1	4	2.90	.885
IT used to link all the levels in the Factory	30	1	4	2.70	.750
Employees use IT systems in the Inventory	30	1	5	1.70	1.119
Use of technologies like RFID, Barcodes, EDI,	30	1	4	2.80	.847
Matching of Accurate inventory quantities to systems reported quantities	30	1	4	2.70	.794
Inventory visibility from physical receipt	30	1	5	3.83	.986
IT used in handling Inventory Functions	30	1	5	3.97	1.159
IT used in Inventory Decision Making	30	1	4	3.37	.964
IT influenced on Re Ordering System	30				
Valid N (list wise)	30				



# D. HYPOTESIS TESTING

In testing **Hypothesis 1**,

“Information Technology has played a critical role on the performance of the Inventory Management”.

The researcher is proposed to study the effect of Information Technology on the performance of the inventory management. Do Information Technology has played a critical role on the performance of the inventory management. To examine use of information technology on the performance of the Inventory management, hypothesis is formulated which is stated as:

**H0:** The use of information technology does not have a significant effect on the functioning of the Inventory Management

**H1:** The use of information technology has a significant effect on the functioning of the Inventory Management.

To explore the use of information technology on the functioning of the Inventory is measured on categories namely “To a large Extent”, “To great Extent”, “To a Moderate Extent”, “To a Low Extent” or “To a very Low Extent”, therefore appropriate test for testing the above hypothesis is “One Sample ‘T’ Test. The One-Sample T Test compares the mean score of a sample to a known value. Usually, the known value is a population mean.

## One Sample T-Statistics

One sample t-test is a statistical procedure used to examine the mean difference between the sample and the known value of the population mean. In one sample t-test, we know the population mean. We draw a random sample from the population and then compare the sample mean with the population mean and make a statistical decision as to whether or not the sample mean is different from the population mean.

### One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
To What extent is IT used in handling Inventory Functions	30	3.83	.986	.180

### One-Sample Test

Test Value = 1					
	T	df	Sig. (2 tailed)	Mean Difference	95% Confidence Interval of the Difference Lower Upper
To What extent is IT used in handling	15.747	29	.000	2.833	2.47 3.20

## Inventory Functions

**Interpretation**

The above question has a calculated value (t-value) of 15.747 and a critical value of approximately 2.000 at 5% level of significance and degree of freedom of 29.

**Inference:**

From the above analysis, the calculated value is above the tabulated value, therefore the null hypothesis (H0) should be rejected in favor of the alternative hypothesis (H1) accepted. Also, the two tail significance level which is 0.00 is less than 0.05 which is the level of significance; therefore the null hypothesis should be rejected. Hence, the use of information technology has a significant effect on the functioning of the Inventory Management.

**Using ANOVA****Hypothesis 1**

**H0:** The use of information technology does not have a significant effect on the functioning of the Inventory Management.

**H1:** The use of information technology has a significant effect on the functioning of the Inventory Management.

Model Summary				
Model	R	RSquare Square	Adjusted R	Std. Error of the Estimate
1	.689 <sup>a</sup>	.475	.456	.855
a. Predictors: (Constant), To What extent is IT used in handling Inventory Functions				

ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	18.510	1	18.510	25.335	.000 <sup>a</sup>
	Residual	20.457	28	.731		
	Total	38.967	29			
a. Predictors: (Constant), To What extent is IT used in handling Inventory Functions						
b. Dependent Variable: To What extent is IT used in Inventory Decision Making						



**Interpretation of Results:**

The results from the model summary table revealed that the extent to which the variance in handling of the inventory can be explained by the model that is 47.5% i.e. (R square = 0.475). The ANOVA table shows the F-calculated value to be 25.335 at 0.001 significance level. The implication is that the use of information technology has a significant effect on the functioning of the Inventory.

Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error		Beta	
1	(Constant)	.859	.637		1.349	.188
	To What extent is IT used in handling Inventory Functions	.811	.161	.689	5.033	.000
a. Dependent Variable: To What extent is IT used in Inventory Decision Making						

The coefficient table above shows the simple model that expresses the extent to which information technology affects the operation of the inventory. The model is shown mathematically as follows;  $Y = a + bx$  where  $y$  is the handling Inventory Functions and  $x$  is information technology. "a" is a constant factor and  $b$  is the value of coefficient. From this table therefore, Handling Inventory Functions =  $0.859 + 0.811$  Information technology. This means that for every 100% change in handling Inventory Functions, information technology is responsible for 81.1% of the change.

**Inference: m**

The significance level is 0.000 and is less than 0.05, thus we accept the alternative hypothesis and reject the null hypothesis. This implies that use of information technology has a significant effect on the functioning of the Inventory management.

**In testing Hypothesis 2,**

**"The use of Information Technology devices has helped the employees on the performance of the Inventory Management".**

The researcher is proposed to study the use of Information Technology devices has helped the employees on the performance of the inventory management. Do the use of Information Technology devices has helped the employees effective performance on the inventory management. To examine use of information technology on the performance of the Inventory management, hypothesis is formulated which is stated as:

**H0:** The Information technology devices do not help employees effectively on the performance of the Inventory Management.

**H1:** The Information technology devices have helped employees effectively on the performance of the Inventory Management.

To explore the use of information technology devices on the performance of the Inventory Management is measured on categories namely "To a large Extent", "To great Extent", "To a Moderate Extent", "To a Low Extent" or "To a very Low Extent", therefore appropriate test for testing the above hypothesis is "One Sample 'T' Test. The One-Sample T Test compares the mean score of a sample to a known value. Usually, the known value is a population mean.

	One-Sample Statistics			
	N	Mean	Std. Deviation	Std. Error Mean
To what extent can employees use IT systems in the Inventory	30	2.70	.750	.137

One-Sample Test					
	Test Value = 0				
	t	Df	Sig.(2 tailed)	Mean Difference	95% Confidence Interval of the Difference
To what extent can employees use IT systems in the Inventory	19.726	29	.000	2.700	2.42 2.98

### Interpretation:

The question has a calculated value (t-value) of 19.726 and a critical value of approximately 2.000 at 5% level of significance and degree of freedom of 29.

### Inference:

The calculated value is above the tabulated value, therefore the null hypothesis (H0) should be rejected in favor of the alternative hypothesis (H1) accepted. Also, the two tail significance level which is 0.00 is less than 0.05 which is the level of



significance; therefore the null hypothesis should be rejected. Hence, Information technology devices have helped employees effectively on the performance of the Inventory Management.

### Using ANOVA

#### Hypothesis 2

**H0:** Information technology devices do not help employees in effectively on the performance of the Inventory Management.

**H1:** Information technology devices have helped employees effectively on the performance of the Inventory Management

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.341 <sup>a</sup>	.116	.085	1.070
a. Predictors: (Constant), To what extent can employees use IT systems in the Inventory.				

ANOVA <sup>b</sup>					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.226	1	4.226	3.690	.065 <sup>a</sup>
Residual	32.074	28	1.145		
Total	36.300	29			
a. Predictors: (Constant), To what extent can use IT systems in the Inventory					
b. Dependent Variable: Does your Store use any of these technologies RFID, Barcodes, EDI,					

#### Interpretation of Results:

The results from the model summary reveals that the extent to which the variance in supports the employees in inventory can be explained by the model that is 34.1% i.e. (R square = 0.341). The ANOVA table shows the F-calculated value to be 3.690 at 0.001 significance level. The implication is that the use of Information technology devices has helped employees effectively on the performance of the Inventory Management.

The coefficient table shows the simple model that expresses the extent to which information technology devices has helped employees effectively on the performance of the inventory Management. The model is shown mathematically as follows;  $Y = a + bx$  where  $y$  is the employees and  $x$  is use of information technology devices. "a" is a constant factor and  $b$  is the value of coefficient. From this table therefore, Employees =  $0.325 + 0.509$  Information technology. This means that for every 100% change in handling Inventory Functions, information technology is responsible for 50.9% of the change.

Coefficients <sup>a</sup>					
Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Std. Error		
1	(Constant)	.325	.742	.438	.665
	To what extent can employees use IT systems in the Inventory	.509	.265	1.921	.065
a. Dependent Variable: Does your Store use any of these technologies RFID, Barcodes, EDI,					

### Inference:

The significance level is 0.000 and is less than 0.05, thus we accept the alternative hypothesis and reject the null hypothesis. This implies that Information technology devices have helped employees effectively on the performance of the Inventory Management.

### Conclusion:

The study attempted to find whether Information technology has an effect on Management of Inventory in sugar factories in Maharashtra. The study specifically examined to determine the extent of IT adoption in the sugar factories and its influence on inventory management performance. The study was a census study of all the thirty sugar factories in Maharashtra. In view of the findings the study concluded that because IT has been fully adopted in most of the sugar factories in Maharashtra. The study shows that Information technologies in the sugar factories had a great impact on inventory operations. Even though most sugar factories were fully computerized it is observed that none of the factories have applied modern inventory control methods. There are no applications of advance IT techniques like ERP, Bar code, RFID, QR codes or NFC tags etc. The Cooperative Sugar factories need to put in extra efforts to utilize the use of Information technology in their Sugar factories



for better performance. This will not only reduce cost but also save the precious inventory, reduce administrative work load and increase profitability of the Sugar factory. The one sample test and ANOVA test implies that use of information technology had a significant effect on the functioning of the Inventory management. It also implies that Information technology devices have helped employees effectively on the performance of the Inventory Management. Therefore the study concludes that IT had much influence on the performance of inventory management in the sugar factories in Maharashtra.

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