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FROM THE PUBLISHER'S DESK...

Research is an effective way to build knowledge, and educational institutions invariably look towards research in their quest for excellence. Rosary College on its path to enhance quality and strive for excellence, pays due importance to research. Our Interdisciplinary Journal *GYANA* has taken a step forward this year by having all the research articles reviewed by the Peer Team. This will motivate many researchers to contribute to *GYANA*.

We are extremely happy to release this year the XIth volume of the Interdisciplinary Journal *GYANA*. The articles appearing therein will provide insight and relevant information on various topics. We strongly believe that articles in *GYANA* will greatly contribute in building up of knowledge which will benefit teachers, students and the society at large.

My sincere congratulations to the entire Editorial Team and in a special way to Assoc. Prof. Dr. Savio Falleiro for taking the responsibility in bringing up the issue. Dr. Savio Falleiro has taken keen interest and tried to bring quality as much as possible. I also congratulate all the authors for their well researched papers.

I hope and wish that *GYANA* will ignite many many minds.

Rev. Dr. Simão R. Diniz
Principal
(Publisher)

PREFACE

It is exactly one decade that *GYANA*, the interdisciplinary journal of Rosary College of Commerce and Arts, Navelim, Goa, was first published. While the last four volumes of the journal were published with the universally recognized ISSN number, keeping with the times, the present volume is the first edition which is peer reviewed. Incidentally, the journal has now also opened its print space to externals to publish their research papers/articles. Though I have been on the editorial board of *GYANA* for most of the earlier editions, it is my privilege and honour to head the Editorial Board of *GYANA*, Volume XI (No. 1), it being an ISSN numbered peer reviewed journal with papers written by authors not only from Goa, but beyond state borders as well – thus making the journal a *de facto* national level journal.

GYANA XI(1) provides readers with a wide array of papers spanning various domains and fields including Engineering, Social Sciences, Humanities, Finance, Management, Education, Development and Human Development. While my paper highlights the *Case for Life Skills Programme for Students* particularly in the context of containing various adverse impacts on youth including HIV/AIDS, Fr. Joseph Pereira writes about *Tackling Addiction and HIV/AIDS, through Healthy Lifestyles*. In his paper Dr. Raju George writes on *Native Influences in the Evolution of Modern African Poetry*, with Dr. Veena Yardi and Dr. Subhadra Mandalika outlining with the help of a comparative study the *Dietary Patterns and Nutrient Intakes of HIV Positive Women on ART and Not on ART*. A few articles in this volume are Goa-centric. While Dr. Christina De Souza and Dr. Mahesh Pai highlight on *Migration in Goa: A Study of Workers in the Construction Industry*, Dr. Rodney D'Silva writes on the *Impact of Aquaculture Farming on Goan Ecology*. Likewise, while

Dr. Flory Pereira lucidly elucidates on the *Fungal Spoilage of Food in Goa and Use of Plant Extracts for Potential Remedial Measures*, Ms. Surabhi Gore, making use of a case study, writes on *Customer Relationship Management in Health Care Sector in Goa*. Ms. Varsha Naik and Ms. N. Rane make a case for *Inclusion of Indigenous Food in Management of Under-Nutrition in Children below Six Years of Age*, with Ms. Larissa Rodrigues and Ms. Nadisha Coelho focusing on *Examining Environmental Education in Preschool Environments in Goa: Is There Room for Change? Recycled Asphalt Pavements and their Relevance for Adoption in India* has been aptly brought out by Mr. Leonard Joanes, with Ms. Sheryl Afonso e D'Souza and Ms. Larissa Rodrigues co-authoring *The Glass Ceiling and Factors Influencing Women's Career Advancement*. The last two papers of the present volume/issue of *GYANA* are brought out by Mr. John X. D'Souza and Ms. Ancy Gonsalves who write on *A Review of the Challenges Facing the Indian Agricultural Sector* and *Performance Evaluation of Equity Mutual Funds: Selected Equity Diversified Mutual Fund Schemes*, respectively.

As Associate Editor it is my humble responsibility to express a word of thanks to all those who were (in)directly responsible for the successful release of this volume – and I take the opportunity of using this space for doing the same. First and foremost thanks to our College Principal and Publisher, Rev. Dr. Simão R. Diniz, for all the support, and for readily agreeing to the request of the Editorial Board to bring out this volume as a peer reviewed edition open to all research writers within and outside Rosary College. My sincere thanks to the members of the Editorial Board, namely, Associate Prof. Dr. Afonso Botelho, Assistant Prof. Mr. Ignatius Fernandes and Assistant Prof. Mr. Leonard Joanes, for unanimously agreeing with unflinching optimism to make *GYANA* (from this edition onwards) peer reviewed; ...and a publication open for contributions from across the state/nation. Thanks also to my team members for all the assistance during the preliminary scrutiny of the papers – an arduous and time consuming task (especially if quality standards are to be maintained). Sincere thanks are also extended

to all experts who helped in the blind review of the various papers; without the assistance of these external reviewers the journal would have remained non-peer reviewed, thereby falling short of the expected quality standards. Special thanks to Dr. Mericio Travassos, Dr. (Ms.) Irene Furtado, Dr. Saba da Silva, Dr. (Ms.) Prema Rocha and Dr. Purnanand Savoikar, besides Mr. Leonard and Ms. Queenie Fernandes (CinnamonTeal) for their noteworthy contribution towards the 'production' of the present volume. Last but not the least, sincere thanks to all the contributors for their research articles – without their contribution and time, *GYANA* as well as its readers, would have been 'poorer' in the context of the diverse themes addressed. Sincere apologies to the numerous contributors whose papers could not be published on account of varied reasons; we nevertheless thank each one profusely for submitting their papers for consideration of publication – and we do hope that they do continue to contribute papers to *GYANA* in the future as well.

On behalf of the Publisher, the Editorial Board and myself, I end by assuring all that *GYANA* will always strive not only to encourage faculty, students, researchers and others to research and research writing, but that we will maintain its standard (befitting a research journal) not only in the context of Goa, but nationally as well as internationally.

Dr. Savio P. Falleiro
Editor-in-Chief
18th February 2016

CONTENTS

CASE FOR LIFE SKILLS PROGRAMME FOR STUDENTS

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ABSTRACT

HIV/AIDS has invariably been known for the dubious role it plays in terms of varied adverse fallouts. One way of controlling the adverse fallouts of HIV/AIDS is by preventing the spread of HIV infections itself. In the context of inadequate levels of awareness among youth on human sexuality and HIV/AIDS, this paper highlights the necessity of having a compulsory module or programme on *Life Skills* in educational institutions as an effective tool in the fight against HIV/AIDS.

Keywords: awareness; HIV/AIDS; human sexuality; life skills programme; sex education

Introduction

Ever since its detection, HIV/AIDS has been known for its extreme adverse fallouts. It has played havoc with households, communities and even economies of many nations. It has far reaching consequences including those of economic nature (Falleiro 2014a; 2014b; Pradhan et al 2006). While as of 2012 an estimated 35.3 million people were living with HIV globally (UNAIDS 2013, 4), the figures of AIDS deaths were estimated to be 36 million (GSACS 2014). With the rate at which lives were lost (around 2–3 million

per year) up to a few years back, it was estimated that the number of AIDS deaths across the world would be equal to or even greater than the number of lives lost in various conflicts including the First and Second World Wars, the American Civil and Spanish Civil Wars, the Vietnam and Korea Wars, the Bolshevik Revolution, the first Chinese Communist War and even the Partition of India, all put together (Falleiro 2015b, 39). With reference to India, as per various estimates, there are presently over 2 million HIV infected people living in the country.

HIV/AIDS has serious impact on children, teens and young adults (Falleiro 2015a). About 39 percent of new HIV infections and almost one-third of the global total of HIV+ people are aged 15–24 (GSACS 2014). According to Foradian (2014), 34 percent of the HIV+ population in the world is within the age group of 12–19 years. This is indicative of the inherent vulnerability of youth in most cultures, a fact which is constant even though there are or may be different contexts within each culture (WCC 2002, 15). Young people are vulnerable because of risky sexual behaviour, substance use and lack of access to HIV information and prevention services.

AIDS education is usually not offered in schools; when occasionally done, it is for the relatively older students (>15 years), though 42 percent boys and 69 percent girls between 15–17 years are not in school (HRLN 2008, 88; Medhini et al 2007, 572). According to a study most of the literate youth in India had not studied beyond Std. VII (Mukherji 2008, 5). In the context of Goa, among the better states of India in terms of literacy, it was reported a few years earlier that an average of 4000 students drop-out before completing their schooling, with only about 20 percent of those enrolling in Std. I going to Std. X (Malkarnekar 2008, 3).

On account of the serious consequences of HIV/AIDS and considering that all may not be well on its awareness front as indicated by the low Gross Enrollment Ratio (GER) and reports of the Behavioural Surveillance Survey (BSS) and National Family Health Survey (NFHS), this paper by touching upon the unhealthy awareness levels of students makes a case for compulsory modules

on Life Skills Programme (LSP) or Sex Education (SE) [as it is often referred to as] in educational institutions as a cost-effective tool to control the adverse fallouts of HIV/AIDS – by preventing the spread of HIV infection itself.

Goa, a state on which the present paper broadly focuses on, is a moderate HIV prevalence state in India. It had a total of 15,574 detected HIV+ cases as of September 2014, with sexual mode of HIV transmission accounting for up to 96 percent of the cases (GSACS, 2014). Almost 80 percent of HIV/AIDS cases detected in Goa during 2013 belonged to the age group of 15–49 years.[1]

Awareness Levels among College Students

Way back in the year 2007, *The Week* (June 3) in its cover story highlighted how some youth in India live over-pampered, highly-indulgent and shocking liberal lives. Besides revealing that close to 50 percent were not well read, it reported how over 70 percent were sexually active at a very young age, with close to three quarters getting information about sex from friends and/or porn magazines/films. While the above may appear as something 'foreign' to Goa, reality shows that youth in Goa are not far behind in terms of the reported behavioral patterns.

There are numerous competing messages about sexuality in the world, with many being misinformed and sensationalist; the primary purposes of many being only to sell a product and not to equip the young for a healthy and fulfilling adult life.[2] With reference to Goa that all was not fine in terms of awareness among youth in terms of human sexuality and HIV/AIDS was reported by Falleiro (2010; 2011) through a study involving undergraduate (UG) college students. While he showed majority of the sample students at 85.78 percent claiming they were taught about human sexuality, over 87 percent indicated that their parents were not involved, with over 42 percent stating that their teachers did not do the teaching either; a sizeable number of 46 percent and 40.8 percent revealed that their sources of information were partly peers/friends and way-side books/magazines respectively. Incidentally, among those who claimed awareness, many were having erroneous

and potentially harmful views on various issues. With reference to HIV/AIDS, Falleiro (ibid) shows substantial lack of awareness – something unexpected considering that the sample was 'highly educated'. For example, whether HIV and AIDS are one and the same, one-fourth respondents indicated either lack of awareness or incorrectly averred that they were. Interestingly, although three-fourths gave the correct response, 10 percent erroneously indicated that it was AIDS which comes first. A quarter of the respondents indicated that there were medicines/vaccines for complete cure of HIV/AIDS; while there was substantial deficiency of awareness on issues related to pre and post-natal transmission of HIV from mother-to-child, many were unaware of ways of protecting oneself from the virus. Additionally, while the overwhelming majority of almost 85 percent students did not answer the question related to the meaning of 'window period' (with some of those answering having an incorrect understanding), about two-third respondents incorrectly stated that an HIV+ person always has AIDS alongside.

Case for LSP

The present educational system has not been adequate or effective in equipping students on HIV/AIDS and human sexuality. The findings of Falleiro (2010; 2011) are indicators that if final year UG students have high levels of ignorance, the position of those not seeking higher education would be worse. Needless to say, there is a greater need to have adequate awareness among students in present times due to more liberal lifestyles and exposures – many of which were non-existent earlier. With traditional norms and the role of the family losing their importance in governing people's sexual behaviour, school/college based programmes on human sexuality are needed that will provide accurate information on issues like pregnancy and sexually transmitted diseases (STDs) (Abraham and Kumar 1999, 146; see also Falleiro 2015a, 83). Absence of the same will not only make students vulnerable to stress, trauma, STDs, pregnancies, suicides, abortions, birth of orphans and HIV/AIDS, but it will make them depend on unreliable sources of information

like adult movies, pornographic web-content, television or peers (Falleiro 2010; 2011; Patil et al 2002; Pedus 2014).

Considering the inadequate awareness, there is a need for revamping the educational system. Falleiro (2010; 2011) revealed that majority of the students (almost 9 out of 10), wanted LSP/SE as a separate paper to be handled throughout the year, since the classes would help them be better informed and responsible. To a large extent these findings correspond to those of Kore et al (2004), NFHS-3 and International Institute of Population Sciences (IIPS) (see Kher 2008, 3). The desire for LSP/SE is growing due to early maturation age, delay in age of marriage, concerns related to HIV/AIDS, increased exposure among youth with more opportunities for interaction among boys and girls (Kher 2008, 3; see also Falleiro 2015a). The IIPS survey reported that students consider teachers to be the best people to impart SE.

In spite of its importance there is uneasiness and resistance often witnessed in India to the introduction of LSP in schools/colleges. Besides treating the issue as taboo, there is the fear that LSP may lead to greater sexual experimentation and promiscuity (see also Falleiro 2015a). Total opposition to LSP however does not auger well for present times when there is much exposure to pornography,[3] courtesy, an unmonitored and easily accessible internet and a thriving multi-billion dollar (porn) industry. The US National Study Commission on Pornography reported how a large number of junior high school and high school students who admitted seeing hardcore pornography were doing some of the things within a few days of exposure (see Apte 2008, 124). Porn 'plague', obsession and/or addiction are not uncommon in India, with the same having multi-dimensional adverse implications ranging from depression, low libido, rise in crime rate, sexual infections, women trafficking etc (Sunavala 2015, 9; see also Mahapatra 2015, 6). Falleiro (2007; 2008) shows how living healthy lifestyles was increasingly being disregarded by a large number of students, with physical relationships, substance abuse and involvement in pornography being reported by college students in Goa. Underrating youth in spite of their reported involvement in

sex-crimes, heavy use of drugs, alcohol consumption, prostitution and alarming number of HIV+ cases, pregnancies, abortions and STDs can be only to our peril (see also Yadav and Iqbal 2009, 61). In Delhi, a survey showed over 10 percent school/college students admitting having sexual intercourse, among whom 25 percent boys had sex before the age of 13, with 57 percent having multiple partners (Singh 2007, 8). Similar findings have also been reported by others like Falleiro (2010).

LSP, SE and/or HIV/AIDS education does not increase sexual activity or sexual experimentation; on the contrary it contributes to the postponement of sexual activity initiation (Rao 2000, 553; Rajamanickam 2006, 70; WHO 1995, 36). Rather than promoting promiscuity, open and participatory modules empower youngsters to say 'no' (Keenan 2008, 12). Based on pilot projects on school-based HIV/AIDS education WHO (1995, 36) reported that SE increases the adoption of safe practices among sexually active young people and that it is more effective if given prior to the onset of sexual activity (see also Falleiro 2015a).

On account of the ground reality facing the present generation outright rejection of modules (scientifically designed to suit the diverse backgrounds of students in terms of age, gender, region and religion) on LSP can do more harm than good. Denial of the existence of risk behaviour only facilitates the spread of HIV and STDs (see Verma and Roy 2002, 83). With statistics revealing 31 percent of the reported AIDS cases coming within the age group of 15 to 29 years, one certainty of LSP is that it will contribute towards arresting the spread of HIV/AIDS in India (Foradian 2014). It needs to be reiterated that the focus of LSP is to teach about the reproductive system and discuss issues like relationships, respect, chastity, responsibility and fidelity; it additionally attempts to promote psychological and physical well-being (UN Women 2012). SE while enhancing the sustainability of a balanced culture (Pedus 2014), helps one to develop into a healthy and normal individual who can use instincts without obsession (Sinha 1995, 7). Teaching about sexuality encourages students to develop a sound set of personal values based upon respecting themselves and others;...

those who would be able to take a positive approach to managing their lives and develop skills for current and future life challenges[4] (see also Falleiro 2015a).

Conclusion

LSP is one of the most effective ways of prevention of HIV/AIDS notwithstanding its 'daunting' nature since it involves sensitive issues and variety of people (see Avert 2014). Insufficient levels of awareness on human sexuality and HIV/AIDS among youth coupled by their highly vulnerable lifestyles in terms of physical relationships makes the compulsory introduction of LSP all the more imperative. LSP is in line with the Adolescence Education Programme (AEP), a programme positioned by the Department of Education and National AIDS Control Organisation (NACO) as a key intervention in preventing new HIV infections and reducing social vulnerability to the infection[5] (see also MHRD 2014).

Tackling HIV/AIDS after getting infected is costly; $1 invested in prevention is supposed to be equal to about $67 saved on care and support (HRLN 2008, 34; see also Falleiro 2014a). It is time we control HIV/AIDS at practically no cost in relative terms by relying on the age old adage that '*prevention* is better than cure', with one best way being through awareness modules involving *interactive* LSP (see also Yadav and Iqbal 2009, 68). Besides controlling HIV/AIDS, the same would also contribute positively to bust misconceptions and reduce discrimination (see also Falleiro 2015a; WHO 1995, 36).

NOTES

1. See *oHeraldo*, December 1, 2014: 3.
2. Retrievedfrom:http://www.education.vic.gov.au/schoolteachers/teachingresources/social/physed/pages/aboutwhy.aspx
3. While students have been reported watching porn for as high as 14 hours a day, the number of women watching porn is also reported to be on the rise (Sunaval 2015, 9).

4. Retrieved from: http://www.curriculumsupport.education.nsw.gov.au/primary/pdhpe/growth/sexed004.htm
5. Retrieved from: http://unicef.in/PressReleases/268/Adolescence-Education-Programme-teachers-to-be-awarded-for-imparting-quality-HIVAIDS-awareness

REFERENCES

Abraham, L. and Kumar K.A. (1999). Sexual experiences and their correlates among college students in Mumbai city, India. *International Family Planning Perspectives, 25*(3): 139–146, 152.

Apte, H. (2008). College men, sexual knowledge and pornography in Pune. In R.K. Verma, P.J. Pelto, S.L. Schensul and A. Joshi (Eds.), *Sexuality in the time of AIDS: Contemporary perspectives from communities in India*, 109–125. New Delhi: Sage Publications.

Avert. (2014). *Sex education that works.* Retrieved from: http://www.avert.org/sex-education-works.htm

Falleiro, Savio P. (2015a). Unhealthy lifestyles and low awareness levels among youth: Need for sex education in the context of HIV/AIDS. *Researchers World – Journal of Arts, Science and Commerce*, Vol. VI, Issue 1(1): 79–87.

-----. (2015b). The economic burden of living with HIV/AIDS. *Mind & Body, Heart & Soul*, Vol. No. V (April): 39–41.

-----. (2014a). *Economic impact of HIV/AIDS on households.* New Delhi: Sage Publications.

-----. (2014b). The state of health in India: The role of HIV/AIDS in the exacerbation of poverty. In Savio P. Falleiro and A. Botelho (Eds.), *Socio-economic inequities and the health sector: Issues and perspectives.*1–22. Goa: CinnamonTeal.

-----. (2011). Education vaccine: The priceless option towards HIV prevention. *Gyana*, Vol *VI*(I): 1–13.

-----. (2010). Sex education in times of HIV/AIDS. *Goa Today, XLV*(1):72–74.

-----. (2008). Haves and have-nots of computers. *Goa Today, XLII*(1):13–15.

-----. (2007). The lives and times of our youth. *Goa Today, XLI*(1): 41–44.

Foradian. (2014). *Sex education: Is India ready for it?* Retrieved from: http://foradian.com/sex-education-is-india-ready-for-it/

GSACS. (2014). *HIV/AIDS in Goa.* Goa State AIDS Control Society. Retrieved from: http://www.goasacs.nic.in/HIV_data_final.pdf

HRLN. (2008). *A judicial colloquium – HIV/AIDS and the law.* New Delhi: Human Rights Law Network.

Keenan, L. (2008). Case for sex education in schools. *The Hindu,* January 26: 12.

Kher, S. (2008). Youth want sex education: Survey. *The Indian Express*, February 19: 3.

Kore, S.J., Pandole A., Nemade, Y., Putharaya, S. and Ambiye, V.R. (2004). *Attitude, knowledge, beliefs about HIV/AIDS in college going adolescents.* Retrieved from: http://www.bhj.org/journal/2004_4602_april/html/attitude_146.htm

Mahapatra, Dhananjay (2015). Porn leading to rise in sexual offences. *The Times of India*, October 11: 6.

Malkarnekar, G. (2008). Average of 4,000 students drop out every year: Study. *The Times of India*, October 15: 3.

Medhini, L., Jain D. and Gonsalves C. (Eds.). (2007). *HIV/AIDS and the law – Volume I.* New Delhi: Human Rights Law Network.

MHRD. (2014). Adolescence education programme. Dept. of School Education & Literacy, Ministry of Human Resources Development, Govt. of India. Retrieved from: http://mhrd.gov.in/adolescence_programme

Mukherji, A. (2008). One in three of India's youths is illiterate: Study. *The Times of India*, February 16: 5.

Patil, S.S., Chaturvedi, R. and Malkar M.B. (2002). *Sexuality and sexual behaviour in male adolescent school students.* Retrieved from: http://www.bhj.org/journal/2002_4404_oct/review_664.htm#5

Pedus. (2014). *Breaking the barrier: The importance of sex education for adolescents.* 28th July. Retrieved from: http://www.tigweb.org/youth-media/panorama/article.html?ContentID=21199

Pradhan, B.K., Sundar R. & Singh S.K. (2006). *Socio-economic impact of HIV and AIDS in India.* New Delhi: NACO, NCAER and UNDP.

Rajamanickam, M. (Ed.). (2006). *Psychological perspective of HIV & AIDS*. New Delhi: Concept Publishing Co.

Rao, D.B. (Ed.). (2000). *HIV/AIDS: Issues and challenges - Part II*. Guntur (AP): Discovery Publishing House.

Singh, K. (2007, November 2). South Delhi teens have multiple sex partners. *The Times of India*, p. 8.

Sinha, S. (1995). *AIDS awareness*. New Delhi: Anmol Publications Pvt. Ltd.

Sunavala, Nergish (2015). Parishes, counselors battle 'porn plague'. *The Times of India*, September 14: 9.

UNAIDS (2013). *Global Report: UNAIDS report on the global AIDS epidemic 2013*. Retrieved from: http://www.unaids.org/sites/default/files/en/media/unaids/contentassets/documents/epidemiology/2013/gr2013/UNAIDS_Global_Report_2013_en.pdf

UN Women. (2012). *Life skills programmes for children and adolescents*. United Nations Entity for Gender Equality and the Empowerment of Women. Retrieved from: http://www.endvawnow.org/en/articles/1694-life-skills-programmes-for-children-and-adolescents.html?next=1708

Verma, R. and Roy T.K. (2002). HIV risk behaviour and the sociocultural environment in India. In S. Panda, A. Chatterjee and A.S. Abdul-Quader (Eds.), *Living with the AIDS virus: The epidemic and the response in India*, 78–90. New Delhi: Sage Publications.

WCC. (2002). *Facing Aids*. Geneva: WCC Publications.

WHO. (1995). *Global programme on AIDS: 1992–1993 progress report*. Geneva: World Health Organisation.

Yadav, P. and Iqbal N. (2009). Impact of life skill training on self-esteem, adjustment and empathy among adolescents. *Journal of the Indian Academy of Applied Psychology*, Vol. 35, Special Issue, 61–70. Retrieved from: http://medind.nic.in/jak/t09/s1/jakt09s1p61.pdf

TACKLING ADDICTION AND HIV/AIDS – THROUGH HEALTHY LIFESTYLES

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ABSTRACT

The global scenario of HIV/AIDS calls for a deeper study of its multi-faceted dimensions. Globally, people from across strata are afflicted and affected by this pandemic disease. Whilst this disease has many modes of transmission, Goa, commonly known as 'Tourist's paradise', demonstrates a trend of transmission of this disease through some very specific routes. One of these is through Substance Abuse. In the past thirty four years of its existence in India (of which twenty four years in Goa), Kripa Foundation has observed a close link between the two co-morbidities – Addiction and HIV/AIDS. This article aims to reflect and throw light up on the link that binds these two diseases together. It will assist the reader to gain an understanding of how Addiction and HIV/AIDS run parallel as a phenomenon and unless they are addressed simultaneously, the vicious circle of cause and effect between the two will not break. A serious need to assess life styles that promote this vulnerability is necessary to make a significant contribution both to the prevention and arresting the rapid spread to pandemic degree.

Keywords: addiction; HIV/AIDS; healthy lifestyles

In the early eighties when Kripa Foundation began working with the marginalized population of Addicts, the average age of the patient was 50 years. Unfortunately this has been on a decline ever since, with the average age of our clients today being 14 to 24 years. This drastic shift in the age group affected and seeking treatment, has been of great concern and source of reflection to us as the largest Organization working in the field of Addiction and HIV/AIDS (affiliated with the Ministry of Social Justice and Empowerment, GOI). This demographic shift has consequently led us to gradually widen our perspective to involve the Family in treatment as well. It is a well-known fact that the Genetic factor can be a determinant in individuals to develop Substance Use Disorders. The lurking genetic predisposition in the child of an addict has a greater chance of manifestation earlier in life and at a much younger age for individuals with financial independence, exposure to drugs/ alcohol, more nuclear family set-ups and increasing environmental stressors etc. are more common and stronger influence now, than ever before. The new age job opportunities such as working at BPOs introduces individuals to excessive expendable income in a very short period of time without much skill set requirement. The experiences of these job settings may give rise to psychosocial problems including disruption in family life, use of tobacco and alcohol and other drugs, etc. (Bhuyar et al 2008). The exposure of the youth to mind altering substances for entertainment or faulty stress coping mechanisms, eventually leads to a complete change in the life style of the young generation. Nowadays, substance use glamorized to give a feeling of '*looking cool*' and '*fitting in*', finds its way through gateway drugs (such as flavored alcoholic drinks and marijuana) into the lives of adolescents as early as middle school nowadays. The pattern of socializing then trends towards abandoning all modes of Morality and sexual integrity. This is the beginning of a change of life style. The parents and teachers are left totally helpless and the kind of freedom the youth demands makes them susceptible to what is known in psychology as the "*king baby syndrome*" (Cunningham 1986). This overstaying of the infantile psyche according to Sigmund Freud and the teachings of Carl Jung

become the source of developing an "*Addictive Personality*". When this trait is combined with the existing genetic predisposition in an individual, a lethal combination of compulsive behavior gets triggered off at a very young age. Hence, while looking at the long term goal of preventing addiction in individuals, introducing healthy lifestyle options and educating the youth about making the right choices becomes instrumental in reducing the prevalence of this disease.

As per my clinical observation while working in this field for over thirty four years, in many Goan families there is also seen the phenomenon of psychiatric disorder. When youth are not aware of such a genetic predisposition and rush into the use of mind altering substances, the result is typically fatal, i.e., a full blown mental health crisis.

The environment today plays a major role in the formation of the addictive personality. The interplay of the environment component along with the genetic and biological factors completes the makeup of a full blown addict. In keeping with the new Mental Health Care Bill, 2013, we need a special focus of treatment when dealing with substance abuse and/or mental illness. While setting up such facilities, it is crucial to keep the standards of the Mental Health Care Bill, 2013 in mind. In the same line of thought, we also need to set specific standards for Psychiatric Nursing Homes as well as specialized facilities for Substance Abuse and Mental Illnesses.

The learned psychiatrist, Dr. Carl Gustav Jung, in 1931 treated Rowland Hazard, an American business executive for about a year for addiction, soon after which Hazard resumed drinking and returned for further treatment. Jung told Hazard that his case was nearly hopeless (as with other alcoholics) and that his only hope might be a spiritual conversion with a religious group (Pass It On': The Story of Bill Wilson and How the A. A. Message Reached the World, 1984, Retrospective 1961 letter from Dr. C.G. Jung to Bill Wilson about Rowland Hazard III, 1961).

Later, an Episcopalian Pastor, Dr. Frank Buchman helped facilitate this religious movement, later coined as the "Oxford Group" owing to the group of men from Oxford travelling to

South Africa in 1928, where the press, at a loss how to describe this new religious movement, coined the term the "Oxford Group" (Lean 1985). This group was later renamed the "Moral Re-Armament" (MRA) after Buchman launched a campaign for Moral and Spiritual Re-Armament in east London signaling a new commitment to try and change the course of nations in 1938, as the nations were rearming for war. Launching a campaign for "Moral Re-Armament" in East Ham Town Hall in 1938, Buchman said:

> *"We need a power strong enough to change human nature and build bridges between man and man, faction and faction. This starts when everyone admits his own faults instead of spot-lighting the other fellow's. God alone can change human nature. The secret lies in that great forgotten truth, that when man listens, God speaks; when man obeys, God acts; when men change, nations change."* (Gaustad and Noll 2003)

Today it is called the "Initiatives of Change" and is being headed by none other than the Grand-son of Mahatma Gandhi, Dr. Rajmohan Gandhi (Initiative of Change, 2015). The self-help Model of Recovery adopted this teaching and blended it with the need to bring about a psycho-social transformation in the Society at large. The need to bring about a collective consciousness that can reverse trends of self-gratification was the effective instrument of the Self-help Healing model.

Dr. Jung in a letter addressed to the Founding Fathers of AA openly declared,

> *"I am strongly convinced that the evil principle prevailing in this world leads the unrecognized spiritual need into perdition if it is not counteracted either by real religious insight or by the protective wall of human community. An ordinary man, not protected by an action from above and isolated in society, cannot resist the power of evil, which is called aptly the Devil. But the use of such words arouses so many mistakes that one can only keep aloof from them as much as possible.*

> *You see, "alcohol" in Latin is spiritus, and you see the same word for the highest religious experience as well as for the most depraving poison. The helpful formula therefore is: spiritus contra spiritum."* (Bamuhigire 2009)

This teaching inspires us to create that protective wall of human community. Most places across this world have either lost or damaged this protective wall, and Goa is no exception. This weak barrier makes the fabric and infrastructure of the society vulnerable to and is now being suspect to all kinds of satanic onslaught of addictive attractions (alcohol, drugs and sex), leading to a rapid deterioration of Goa's infrastructure of a society that has lost its original Indo Portuguese ethos.

Hence the challenge to bring back the healing of the person and society lies in reversing the Necrophilic self-gratification with Biophilic self denying disciplines and lifestyle. In this context the work done by Kripa Foundation in Goa with the recovering Addicts has borne rich fruit and is being used as a pilot project to be replicated across the other centres for changing the life style of youth heading to an addictive life style.

The most well-known and relatively more successful recovery programme for Addiction is the Self-Help Programme. It constitutes of psycho-spiritual and psycho-social principles of restoring interpersonal conflicts. Addiction is a frustration of an 'I-Thou' relationship. As Martin Buber said Love is an "I-Thou" Relationship (Buber 2004). This is Love. When this is not available, the person chooses a substitute and seeks an 'I- It' relationship. The 'It' can be anything ranging from the Substance of one's choice to Sex, Gambling, Food, Pornography, Work, or even God. The ever increasing number of Religious fundamentalists is the recent phenomenon of what is called "God Addiction". In my clinical experience, especially in Goa, this has also played a role in offering quick relief through some kind of a religious 'high'. However such superficial solutions fade quickly and people are left seeking some way to quench their thirst for Love. Humans are social beings who constantly seek this love and they find instant gratification through a variety of stimulants.

The twelve step programme of the Alcoholics Anonymous (AA) (Wilson 2001) has very effective ways of healing that 'I-Thou' longing within the human heart. It does this through the Psycho-spirituality of reconnecting the Addict with the God of one's own understanding. The second step of the 12 step programme as mentioned in the Big Book states that one must believe that a Power greater than themselves could restore them to sanity, where one finds reference to the source of Healing. One may often wonder how a person who is lost in a world of his own, can be made to open up to a reference other than his/her own Ego? The co-founder of the AA, Bill W., describes Addiction as 'Self-will running wild'. An addict, it is commonly said, lives in a world with a population of just one – his own self. To tide over this major obstacle one has to bring about a genuine experience of what is called the "Faith Factor" which is the essence of the second and the third step of the 12 steps. Various psychological methods have been used to bring about this component in a recovering addict. However, in a study by Dr. Harry M Tiebout (M.D.), one finds that most people in recovery display 'Compliance' rather than 'Surrender' (Tiebout 1953). Hence it has been found necessary to find more genuine and effective methods of bringing about this surrender in a recovering person. There is a well-known saying of St. Paul with regard to the inadequacy of knowledge alone. He says, "*I know what is good and I know what is bad, I know good has to be done and evil avoided, yet I end up doing the very evil that I hate*" (Romans 7:19, Bible, New International Version). This is where the need of an authentic path way to what Dr. Silkworth called 'Conversion' or '*Metanoia*' (beyond the mind) is called for. The Kripa Model of Recovery integrates the psycho-somatic for the above purpose. In the practice of Iyengar Yoga, when one reaches the stage of '*Ishvarapranidhana*' (surrender to God), it brings about what Herbert Benson speaks of as 'Relaxation Response'. This relaxation response is also referred to as 'Remembered Well-being', which Benson explicitly calls "the Faith Factor" (Benson 2000). The uniqueness of B.K.S. Iyengar is that this factor is brought about in a very measurable manner.

The protocol of Kripa Foundation Iyengar Yoga (KFIY) for Addiction is not a 'Work-out' but rather a 'Work-in'. It is a journey from the periphery to the Centre, from the Sympathetic Nervous System to the Central Nervous System via the Autonomous Nervous System. Hence one is also able to bring about what is now called the Nitric Oxide or Nitrogen Oxide (NO) effect. Benson in his recently published book the Breakout principle, states that, "... *my research suggests that the effective 'letting go' of a problem triggers the internal release of NO which has been linked to the production of neurotransmitters such as endorphins and dopamine*" (Benson and Proctor 2004) This measurability of Iyengar Yoga brings about the most valuable Psycho-somatic dimension for the recovery of an Addict. It is Benson again who had stated in the *Lancet*, British Medical Journal way back in the early 90's, that Yoga and Meditation could change a *Type A* personality to a *Type B* personality. This is the basic requirement for a 'life style change' that effectively brings about healing of both addiction and addiction related ailments such as HIV/AIDS.

Originally Patanjali practised yoga as a means for 'chitta vritti nirodha' meaning - cessation of the fluctuations of the mind. In the teaching of B.K.S Iyengar especially for addicts who are capable of playing multiple games (Steiner 1984), it is necessary to have 'snayu vritti nirodha' (cessation of the fluctuations in the cells). Our body never tells lies and so when the person in recovery obtains the results of inner equilibrium i.e. 'homeostasis' within one's cellular consciousness, the resultant effect is more authentic that the 'compliance' mode that Dr. Tiebout cautions about. This is further consolidated by the four psycho-social dimensions of the Self-help programme. Dr. Vailant explains this beautifully to understand how these four aspects can nurture what has begun on the individual level to take to the level of Society and contribute to the change of an entire affected society. The four factors which help recovery are: (i) external supervision, (ii) ritualized dependency on a competing behavior, (iii) new relationships, and (iv) deepened spirituality (Vaillant 2008). In a modern world that has lost all sense of conscience, the AA philosophy does not encourage or

trust the free will, and hence the first need of the Sponsor being to maintain this humility. The second need is to replace criticisms with loving suggestions. Third, loving relationships are important to change the life style. Finally, recovery is always a discovery of spirituality. In an Indo-Portuguese environment, one can easily find infrastructure for such supportive safe guards in a tourist state. The use of both Yoga and Meditation thus becomes a strong 'protective wall of human community'.

The multifaceted ailment of Addiction has brought in a major challenge of keeping the Society from rapid degradation. Today, new drugs are being synthesized at a high rate in home laboratories making it challenging for supply reduction law enforcement to keep up with maintaining a list of contrabands. With the easy accessibility and the increasing potency of mind altering substances, all universal precautions to HIV/AIDS and other life threatening diseases are becoming weak and scarce leading to the increase of a high risk and vulnerable population.

In conclusion, it is important for us to remember that it is not the substance or the various addictive attractions that are the factors but rather the weakening fabric of an individual and the society that is becoming more easily a pray to such destructive agents. As it is made to internalize in the self-help methodology, it is not the substance that comes to the person, but the person that goes to it. Hence, there is an age old adage in the Veda, viz. '*yatha pinde thatha brahmande*', meaning – 'as it is on the level of cellular consciousness so it is on the global consciousness'. Hence, resorting to our age old ethos, our rich heritage and '*Sanskriti*, to reclaim our original blessing of a land rich in Moral and Spiritual values.

Working in the field of substance abuse and HIV/AIDS presents dilemmas relating to personal beliefs, judgments, and values, but it is important for us as professionals, care givers, educators and the society at large to be empathetic and compassionate in dealing with people living with these life threatening diseases. Youth have to be creatively drawn out of the satanic implosion of the thirst for Love by using our own ancient rich heritage to quench the thirst for

Wholeness and Holiness. Meeting this challenge will bring about the change of life styles which is the need of the present hour.

REFERENCES

Bamuhigire, O. (2009). *The healing power of self love: enhance your chances of recovery from addiction through the treatment program of your choice by utilizing the ancient tools of discipline, lateral thinking, and insight from the life experiences of the world's greatest leaders.* iUniverse.

Benson, H. and Klipper, M. (2000). *The relaxation response.* New York, N.Y.: HarperTorch.

Benson, H. and Proctor, W. (2004). *The breakout principle: How to activate the natural trigger that maximizes creativity, athletic performance, productivity and personal wellbeing.* New York, N.Y.: Simon and Shuster. p. 27.

Bhuyar, P., Banerjee, A., Pandve, H., Padmnabhan, P., Patil, A., Duggirala, S., Rajan, S., and Chaudhury, S. (2008). Mental, physical and social health problems of call centre workers. *Indian Journal of Psychiatry,* 17:21–5.

Buber, M. (2004). *I and thou.* London: A&C Black.

Cunningham, T. (1986). *King baby.* Hazelden Foundation.

Gaustad, E. and Noll, M. (2003). *A documentary history of religion in America since 1877.* Wm. B Eardmans Publishing.

Initiative of Change (2015). *Gandhi voyage.* Retrieved from the Initiative of Change website: http://www.iofc.org/gandhi-tour#

Lean, G. (1985). *Frank Buchman - A life. The life of Frank Buchman – A small town American who awakened the conscience of the world.* Constable and Co., Ltd. Great Britain.

Pass It On': *The story of Bill Wilson and how the A. A. message reached the world.* (1984). Alcoholics Anonymous World Service Inc; 9th Print edition. pp 114.

Retrospective 1961 letter from Dr. C.G. Jung to Bill Wilson about Rowland Hazard III - text form, with commentary by the Big Book Bunch. Jung, C.G.

Steiner, C. (1984). *Games alcoholics play.* New York, N.Y.: Ballantine Books.

Tiebout, H.M. (1953). Surrender versus compliance in therapy, with special reference to alcoholism. *Quarterly Journal of Studies on Alcohol*, 14(1): 58–68.

Vaillant, G. (2008). *Spiritual evolution: A scientific defense of faith.* pp. 196.

Wilson, B. (2001). *Alcoholics anonymous.* Courier Corporation.

NATIVE INFLUENCES IN THE EVOLUTION OF MODERN AFRICAN POETRY

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ABSTRACT

Poetry has always been a significant portion of the imagination of the African Diaspora. Ritual incantations to changes in the relationship between the living and the dead or between man the supernatural marks the occasion for poetry in the African aesthetic-mind in addition to love for the homeland and yearning for reunion with the beloved in a distant land. In the case of oral poetry, the composer is to be aware of the presence of his audience. Traditional oral poetry has flourished down the years with the poetry written in African languages. Written poetry does not have a large audience in Africa. This is partly the result of the oral habit of African culture, and partly because poetry in the written as against the song-form has always been an elite-form in the African Diaspora. Towards its domestication, appeals have been made for simplicity of style in the tradition of Africa's indigenous literature and for intense moral commitment in the poets, who should be the voices of the common people to enthuse them to action to improve their circumstances. Domesticated African poetry in English is that which talks to as many Africans as possible about issues of greatest relevance in Africa's ongoing development, both in the public management of affairs and in the maturation of human persons through the emotions and values of life: love, laughter, sorrow, and spiritual growth. Though its language is English, the elements of its background are the total environment of

today's Africa. Its tradition is a convoluting mixture of the basic African origins and the inspiring catalyst of borrowed models. It is poetry, employing all the techniques offered by a wider world to cope with the sensibilities generated by the centuries-old tumultuous history of the African Diaspora.

Keywords: African diaspora; modernity; oral tradition; tradition

Poetry has always been a significant portion of the imagination of the African Diaspora. Ritual incantations to changes in the relationship between the living and the dead or between man and the supernatural, marks the occasion for poetry in the African aesthetic-mind in addition to love for the homeland and yearning for reunion with the beloved in a distant land. In the case of oral poetry the composer is to be aware of the presence of his audience. Traditional oral poetry flourishes down the years with the poetry written in African languages.

Modern African Poetry hails from the one written by Gabriel Okara, when it first appeared in Ibadan in 1957. That was the first whisper. Other pioneers were Christopher Okigbo, Okogbule Glory Nwanodi, and J.P. Clark (all from Nigeria), Awooner-Williams (Ghana), Henrie Peters (Gambia), and Dennis Brutus (S. Africa), who wrote poetry with the deliberate concern for the poetic process. However, those premier whispers of modernity did not popularize until the appearance of publications between 1962 and 1964. Though they formed no school of literature since they were so scattered geographically, Paul Theroux brought them together in one single platform in his work, *Voices out of the Skull*, and provided a common impetus to their individual brands of modernity (*Modern African Poetry: The Domestication of a Tradition*, p. 33). Okigbo admitted that he wrote *Heavensgate* under the spell of the impressionist composers of music: of Debusssy, Cesar Frank, and Ravel, who wrote of a watery, shadowy, nebulous world with the semitones of dream and the nuances of the rainbow. In his introduction to the *Labyrinth*, he presents the influences on

his poem *Lament of the Silent Sisters* as the drowning transition of Hopikns' *Wreck of the Deutschland*, and the 'sirens' of Debussy's *Nocturens* (African Literature Today, p.35). David Rubadiri has this to say:

> *the echoes of the African tradition come to me subconsciously. I hear*
> *the 'theme,' but the technical part of writing poetry is entirely conditioned*
> *by my experience with reading European literature. I was particularly*
> *interested in and probably much influenced by one poet in particular – Gerard Manely Hopkins.*
>
> *His energetic, innovative, highly revolutionary*
> *use of language, his wonderful concatenations of rhythmic patterns*
> *strike strong sympathetic vibrations within me* (Transition, in *Accra*, 41).

Dennis Brutus explains to what extent the world and its literature has been a major force in the forming of his poetic tendencies and consciousness. He acknowledges that he adopted the title of his poem, *Sibyl* from the Greek name for the 'old woman' of the oracle, who made prophesies of doom in order to project his own prophecy about the inevitable bloody destruction that would result from the politics of South Africa (African Writers Talking, p. 36). Alexander Daskalos, a Veterinary Doctor from Angola in one of his poems, *Desolation* graphically depicts the fate of a population suffering from the effects of a calamity. It makes allusion to the practice of forced labour symbolized by Sao Tome, an island where many Africans worked on plantations for their colonial masters:

> *Everyone was sunk without trace*
> *the torrents swept away the corn*
> *The shopkeepers closed their doors*
> *The contract workers went on their way to Sao Tome.*

The black women with babies hanging at long thin teats
journeyed through life's deserts
with dry eyes, tearlessly.
They saw their children die
fallen like cattle on arid pastures.

The corpses brought epidemics.
More fold died
and, they all died
as if they had not died.
Everything came to pass in the muffled silence of the forest.

Now
in the despair of
a ravished and barren maiden
the bare earth bewails
the desolation of the dead landscape (New Poetry from Africa, p. 121).

Poetic experience was liberation of perception, and hence a liberating medium had to be found for the expression of experience. It was the 'environment' that favoured this liberating quality of perception. The individual, depending on his experiences sought the meaning of life in his reactions to the environment, political events, and human relationships like in Catherine Acholonu's *Dissidents*:

She shouted at the heavens
forcing the skies to release the rains
and the rain came in torrents
showering hot pebbles
on their bare skins! (New Poetry from Africa, p. 4)

The commencement of modern African poetry thus sprouts from an individual search mingled with the political. Such an intensive personal search through the labyrinths of public experience led modern African poetry into terrible complexity, privacy, and meaninglessness to an audience that had not shared

the immediate personal situation of the poet. It also led to poetry of intense mental, emotional, psychological, and literary joy like Okigbo's *Watermaid*. According to Nadine Gordimer, "*subconsciously their writings were aimed at white readers and were intended to rouse the white consciousness over black frustration*" (Aspects of South African Literature, p.111).

Thus the movement of modern African poetry was propelled by a meaningful contact with the literary activities of a wider world, received consciously as possible guides to new creativity in the African environment. In *Refugee Mother and Child*, Achebe portrays the piteous picture of emaciating children starving and suffering during the Civil War:

No Madonna and Child could touch
that picture of a mother's tenderness
for a son she soon would have to forget.
the air was heavy with odours

Of diarrhea of unwashed children
with washed-out ribs and dried-up
bottoms struggling in labored
steps behind blown empty bellies.

Most mothers there had long ceased
to care but not this one; she held
a ghost smile between her teeth
and in her eyes the ghost of a mother's
pride as she combed the rust-coloured
hair left on his skull and then-

Singing in her eyes – began carefully
to part it . . . . In another life this
would have been a little daily
act of no consequence before his
breakfast and school; now she
did it like putting flowers
on a tiny grave (New Poetry from Africa, pp. 2–3).

While most mothers have given up hope and ceased to care for their children, this particular mother captures the poet's attention with her matchless, unflagging tenderness for her son.

Another major movement in the evolution of modern African poetry came from the East, from writers like Okot p'Bitek, who fed his creativity from the impact of his culture on his imagination. A sense of cultural nationalism and continuous reaction against the overwhelming presence of European culture is obvious in Okot's *Horn of My Love*. Given the backdrop of his poet-mother and story-teller-father, Okot kept reacting with a consciousness of his own literature when he read the story of Ulysses and the Books of the Bible, especially the *Love Songs of Solomon* (World Literature Written in English, p. 281). The same is true with the West African poets, who reveal the influence of the Igbo tradition of religion, speech, and mysticism of the African tradition even as they were trained in European literary traditions. Thus over the years the modern African poets have established for themselves a language and form to give genuine effective expression to the realities of their own native experiences.

Most African poets have said that in the process of finding their own voice they have had to fall back to their roots to the point where the external influences have become mere catalysts to self-discovery. David Rubadiri said in 1966 ... *and so I began to write more like myself as an African, who's got roots or beginning to get them, as opposed to the young student, who had to live between two worlds, as it were, two values of life* (African Writers on African Writing, p. 122). Kofi Awooner speaks of *an earlier imitativeness of foreign influences and the development of his own voice from the resources of the oral traditions, and in his opinion, none of us, if we are good writers, is in any way diminished by being influenced. We have achieved what we have done, through English writers, not with them* (Nwoga in Modern African Poetry: the Domestication of a Tradition, p.45).

Research in Oral Literature and Courses in Oral Literature establish that the younger poets *now feel closer ties to local poetic traditions. Omabe*, the Poetry-magazine of the Department of

English at the University of Nigeria, Nsukka, contains an excerpt from the poem, *What the Madman Said* by Obiora Udechukwu:

How many baskets of water can mould a block?
How many he-goats can guard a yam-barn?
And we talk of yam-masters
but their sons eat alibo.

Fish that lives in the ocean
that same fish washes with spittle
and you talk of hell.
Does it need death to arrive?

The question looms in the evening cloud
It hangs so it's now part of the sky.
The question their chiefs do not want to see
the question that questions their stools (New Poetry from Africa, p. 43).

Pat Nwoga, Irish by nationality, but has lived in Nsukka University for sixteen years, wrote in the following image obviously taken from local traditions:

Anklets of ivory have become plastic
as men dance to a discordant tune ... (Modern African Poetry, p. 46).

Same is the case with Charles Ezeonwu's poem, *Blowing the Ivory Horns*:

Ivory horns across
nineteen and one royal mouths
talk of –yu pee ee.
Regal steps. Legs of anklets;
digging dance acknowledging
Adulation over –yu pee ee ... (Modern African Poetry, p. 51).

Jared Angira of Kenya, an enthusiastic disciple of Okigbo is another exponent of the African oral tradition in writing poems:

That chloroform sleep
woke me up
in dream
only to find
Ramogi under siege (Anthology of Nigerian New Writing, p. 52).

Angira's poems deal mainly with the plight of the rural poor and with nature. His *Hunger* highlights the effects of hunger on the community, for whom the only staple crop is maize and when it fails has to rely on rations:

The maize will grow
once when
long rains have come
and army worms
have gone.
Rations will sink
with hunger
and the coiled intestines
will straighten ... (New Poetry from Africa, pp. 12–13).

There has indeed been a pervasive influence from Marxism and its variant through Franz Fanon, which has given a tone of conviction to new African poetry. However, the image should be sensuous and intelligent, archetypal and specific, and above all surrealist because that is how African poetry works. Look at Chinua Achebe's poetic diary on the Civil War:

At dawn slowly
the Sun withdraws his
long misty arms of
embrace. Happy lovers

whose exertions leave
no aftertaste nor slush
of love's combustion; Earth
perfumed in dewdrop
fragrance wakes

To whispers of
soft-eyed light . . .
Later, he
will wear out his temper
ploughing the vast acres
of heaven and take it
out of her in burning
darts of anger. Long
accustomed to such caprice
she waits patiently

for evening when thoughts
of another night will
restore his mellowness
and her power
over him (New Poetry from Africa, p. 1).

Poetry of this tradition often appears formless and illogical on the printed page. Its success for the listener and conscious reader derives from the poignant imagery, symbolism, vibrant diction, incantatory rhythmic flow, and alliterations that help to make the poem fit the drum and the chant-medium. Into those images, the dexterous poet puts his theme in capsules of affective sense. Repetitions of phrases and lines help to grind the intended meaning into the consciousness of the reader, and irony appears to be a very common attitude often emerging through this medium. Kofi Anyidoho, Ghana's Poet of the Year in 1984 suggests in the following poem that a conscious attempt to reflect true feelings in signs is often futile because such signs may fail to convey the desired meaning:

Because, because I do not scream
You do not know how bad I hurt.
Because, because I do not kiss on public squares
You may not know how much I love.

Because, because I do not swear again and again
You wouldn't know how deep I care.
You keep saying,
How somehow our world must live by signs
but see how much we give away

Doing time in pursuit of signs
deprived of all meaning
and of all purpose
we break our words in two. Then we
split each half into sounds and silences (New Poetry from Africa, pp. 15–16).

'Domestication,' which has led to addressing a home-audience, and adopting the tone of oral communication, has also confirmed one trend in poetic method – the parabolic stance. Poets have used traditional proverbs in their poems. *The New Brooms* serves to illustrate the ironic proverbial stance of Odia Ofeimum's poetry, the strength of language, and moral stance of the poet:

The streets were clogged with garbage
The rank smell of swollen gutters
claimed the peace of our lives

The streets were blessed with molehills
of unwanted odds and bits

Then, they brought in the bayonets
to define the horizons of our days
to keep the streets clear.
They brought in the new brooms
to keep the streets clear.
They brought in the world-changers

with corrective swagger-sticks.
They brought in the new brooms
to sweep public scores away.

But today, listen today.
If you ask why the waste bins are empty
Why refuse gluts the public places unswept
to have new brooms, that's something.

And if you want to know why
the streets grunt (now)
under rank garbage
under the weight of decay, of night-soil

more than ever before.
They will point triumphantly, very triumphantly
at their well-made timetable:
We shall get there soonest.
Night-soil clearance is next on the list (African Literature Today, pp 51–52).

Written poetry does not have a large audience in Africa. This is partly the result of the oral habit of African culture, and partly because poetry in the written as against the song-form has always been an elite-form in the African Diaspora. Towards its domestication, appeals have been made for simplicity of style in the tradition of Africa's indigenous literature and for intense moral commitment in the poets, who should be the voices of the common people to enthuse them to action to improve their circumstances. Anyidoho employs an admonitory poem, *For Whom*, which exploits animal imagery to convey its message of caution to human beings:

Watch out! You clever one
Take care! You crafty one
Monkey was caught in a trap
consider the fate of Rat!

Lizard has lost its tail
What may become of fox?
Chameleon was found out
Old frog got drowned last night
and Cock has lost his voice

Yesterday was someone's day
Today for someone else
For whom will tomorrow be?

Take care! You clever one
Watch out! You crafty one (New Poetry from Africa, pp. 17–18).

This call is part of a total process in which both critics and poets are joined towards making poetry in English serve useful socio-political purpose. Dennis Brutus through one of his revolutionary poems, *In This Country* dramatizes the beastly treatment meted out to the Africans by the oppressive 'apartheid-regime' in South Africa:

In this country;
In this air;
Where these trees grow;

Where clear air flows
before, behind, above
and through the throat,
flows a cool and crystal stream
to where the milk white domes

In an all-embracing curve
In this country,
In this air,
where these trees grow
poised and moving

As a flame intruding
projects through rings of encircling dark,
where sweet air flows,
and the slim trees grow,
in this country.

Festers hate in fetid wounds
Infection floats on fluid air.
Anger roars in the placid night
and the dark is drizzled with our tears (New Poetry from Africa, p. 25).

Domesticated African poetry in English is that which talks to as many Africans as possible about issues of greatest relevance in Africa's ongoing development, both in the public management of affairs and in the maturation of human persons through the emotions and values of life: love, laughter, sorrow, and spiritual growth. Though its language is English, the elements of its background are the total environment of today's Africa: its tradition is a convoluting mixture of the basic African origins and the inspiring catalyst of borrowed models. It is poetry, employing all the techniques offered by a wider world to cope with the sensibilities generated by the centuries-old tumultuous history of the African Diaspora!

REFERENCES

Awoonor, Kofi (1972). Transition. *Accra*, 41.

Duerden, Dennis et Cosmo Peters (Eds.) (1972). *African writers talking.* New York: Heinemann.

Ekwenski, Cyprian (Ed.) (1977). *Anthology of Nigerian new writing,* Lagos: Routledge.

Fanon, Frantz (1955). *The fact of blackness.* In The Post Colonial Studies Reader, London, Routledge.

Heywood, Christopher (Ed.) (1976). *South African literature.* London: Heinemann.

-----. (1976). *English-language literature and politics in east Africa*. In Aspects of South African Literature. London: Heinemann.

Johnson, et al. (1996). *New poetry from Africa*. Lagos: University Press Plc.

Jones, E.D. (Ed.) (1979). *African literature today*, Ibadan, Heinemann.

Okigbo, Christopher (1971). *Labyrinths*. London: Heinemann.

Rubadiri, David (1973). *African writers own African writing*. London: Heinemann.

Vincent, Theo (1975). *Two decades of Nigerian literature*. Ibadan: Harcourt.

DIETARY PATTERNS AND NUTRIENT INTAKES OF *HIV* POSITIVE WOMEN ON *ART* AND *NART*: A COMPARATIVE STUDY

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ABSTRACT

The AIDS epidemic has had a unique impact on women, which has been exacerbated by their role within society and their biological vulnerability to HIV infection. Incidence of AIDS is rising in women six times faster than that as men. HIV progressively weakens the immune system and results in malnutrition; in turn, malnutrition worsens the effect of HIV and contributes to more rapid progression to AIDS. Food insufficiency can also interfere with the absorption of medications and pharmacokinetics of antiretroviral. The present study, involving 170 women living with HIV, was undertaken to investigate the dietary practices and food intakes of women living with HIV residing in resource limited settings in and around Mumbai. A large majority of participants were on ART. Overall, the meal patterns and the composition of menu indicatYed nutritional inadequacies both in terms of quality and quantity. Subjects reported higher dependency on starchy staples while income elastic foods like flesh foods, milk & milk products and fruits and vegetables that play vital immunity and protective roles were inadequately consumed. Majority of the participants did not have sufficient awareness of nutritious diet.

The baseline data showed that a majority of participants had poor macro as well as micro nutrient intakes with a significant difference between participants on Anti Retroviral Therapy (ART) and 'Not on Anti Retroviral Therapy' (NART). Between the two groups, participants on ART had higher intakes of all the nutrients possibly because of inclusion of three meals daily by a majority. However, intake of all nutrients for both the groups was lower than the Recommended Dietary Allowances (RDA). In conclusion, it may be stated that nutritional intervention may play an important role especially if introduced at the early stages of HIV infection.

Keywords: ART; dietary patters; HIV positive women; nutrient intakes

Introduction

HIV/AIDS is a global health problem which has penetrated every continent and every community. India has the world's third-largest population suffering from HIV/AIDS. Out of the total number of adults living with HIV and AIDS in India 38 percent are women.[1] In India women are already economically, culturally and socially disadvantaged lacking access to treatment, financial support and education. The health of Indian women is intrinsically linked to their status in society (Chatterjee 1990). Among all age groups, prevalence is high in the 15-49 age group indicating that AIDS still threatens the cream of society, i.e. those in the prime of their working lives.[2] HIV progressively weakens the immune system and results in malnutrition; in turn, malnutrition worsens the effect of HIV and contributes to more rapid progression to AIDS. Nutrition and HIV are thus interlinked. Any immune impairment as a result of HIV/AIDS can contribute to malnutrition. Malnutrition leads to immune impairment, worsens the effects of HIV, and contributes to a more rapid progression of the disease. A well-nourished person has a stronger immune system for coping with HIV and fighting illness (Dong and Imai 2012). Food insufficiency can also interfere with the absorption of medications and pharmacokinetics of

antiretroviral (Obi et al 2010). Weight loss and wasting are the common features due to: (i) reduction in food intake, (ii) nutrient malabsorption, and (iii) metabolic alterations. HIV-positive individuals are prone to malnutrition due to inadequate dietary intake, nutritional losses, metabolic changes, and increased requirements for both macro- and micro-nutrients (Kotler 2000; Fenton and Silverman 2003). Anemia is a common problem among People with HIV/AIDS (PLHA) which is associated with increased death in HIV infected persons (Doukas 1992; Sullivan et al 1998). Reversing anemia slows HIV disease progression and prolongs survival (Meda et al 1999; Kawai et al 2010). To ensure micronutrient intakes at daily recommended levels, HIV-positive adults are encouraged to consume adequate balanced diets (WHO 2003). Although ARVs (Anti Retroviral) do not completely destroy HIV, they significantly reduce the replication of the virus in the blood. Moreover, side effects of medication, such as taste changes, loss of appetite (i.e., anorexia), nausea, bloating, heartburn, constipation, vomiting, and diarrhea, indirectly affect nutritional status by causing a reduction in food intake or nutrient absorption. This can lead to weight loss and continuing impairment of the immune system, which, in turn, allows the impact of HIV infection and associated complications on overall nutritional status (Polsky et al 2001).

Good nutrition helps HIV positive people maintain a good body weight and muscle mass. It delays progression of HIV infection to AIDS and helps to stay healthy for a longer period (Hendricks et al 2007). Good nutrition also maximizes the effectiveness of antiretroviral treatment (Segal-Isaccson et al 2006).

Nutrition research is an important strategy in planning and implementing food and nutrition interventions. Currently, there is limited evidence about the efficacy of these interventions as part of HIV prevention and care. Nutritional status, treatment and support programs often provide food supplements according to defined protocols. Such support should be linked to nutritional assessments. With the above rationale, the present study was undertaken to assess dietary patterns, food habits and nutrient

intakes of HIV-positive women on Anti Retroviral Therapy (ART) and Not on Anti Retroviral Therapy (NART).

Objectives

1. To assess baseline characteristics and dietary patterns of women living with HIV (WLHA) on ART and NART.
2. To analyze and compare the nutrient intakes of the participants.

Methodology

One hundred and seventy women living with HIV in the age group of 18–49 years were enrolled for the study from resource-poor settings, and were selected from six community care centers managed by NGOs in Mumbai and one ART center in Thane, Maharashtra, using purposive sampling technique. The primary technique used for collecting data was interview, conducted with the aid of structured interview schedule. The *first part* of this interview schedule sought personal information like name, age, education, occupation, income and other relevant information related to HIV status like period of diagnosis, use of ART, the information about presence of HIV related symptoms/complications etc. The *second part* of the schedule was based on dietary information. It consisted of questions to identify food habits, food preferences and was related to frequency of consumption of foods belonging to different groups. A 24-hour food recall was also a part of this section. A 24-hour dietary recalls were recorded with the help of standard *katories*, cups, spoons, models of *chapattis/bhakaris* etc. Closely approximated raw equivalents of cooked foods were then employed to calculate nutrients. Raw equivalent amounts used for making common recipes were used to calculate macro (Carbohydrates, Protein, Fats and energy) and micro nutrients (Vitamin A [in terms of beta carotene], vitamin C and Calcium, Iron, zinc) of the recipes. *Nutritive value of Indian foods*, by Gopalan et al (2010) was used to do the same. A 'Nutrient Reckoner' along with values for nine nutrients was prepared for common recipes consumed by the participants and was used to calculate the nutrient intakes.

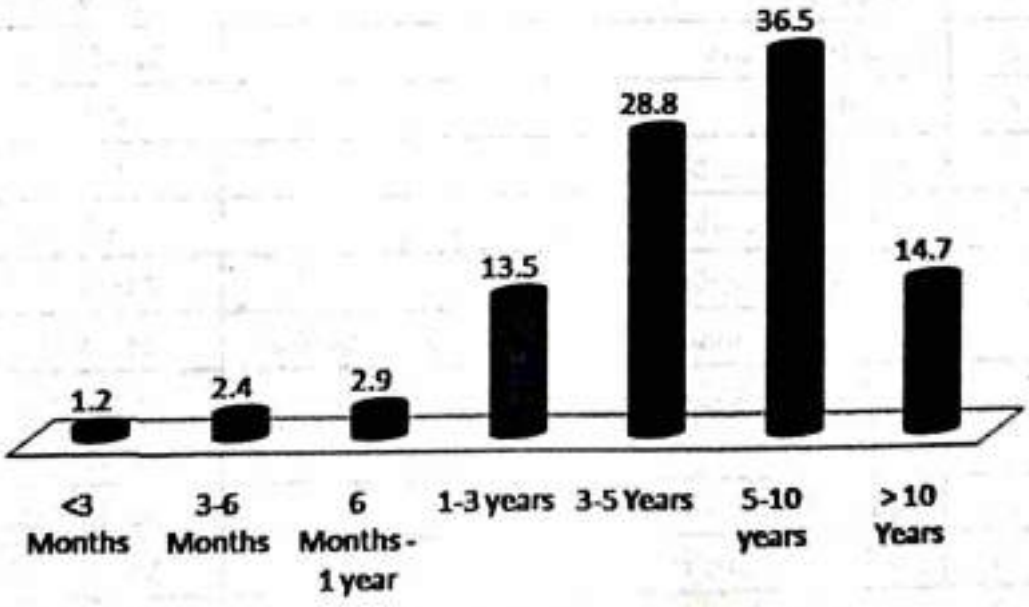
The data was processed using suitable statistical procedures (SPSS version no.17).

Data Collection and Analysis

1. Baseline Characteristics

The subjects belonged to the wide age range of 18 to 49 years with almost a third (35.3 percent) of them who had studied up to the secondary level. Majority (68.8 percent) of the respondents were working women, 64.9 percent of them were self employed mostly working as part time domestic workers with a monthly personal income of Rs. 1995.6±1984.4. Significantly higher proportion (58 percent) of participants was widows shouldering responsibility of the family. Higher proportions (82 percent) of participants were asymptomatic and 77.1 percent had a moderately active lifestyle. The duration of the disease varied between 2 months to 14 years. A majority (36.5 percent) were diagnosed 3 to 5 years prior; followed by 28.8 percent belonging to the diagnosis period of 5–10 years (Fig 1).

Figure 1: Period of HIV Diagnosis



Source: Primary data of authors.

For most of the women diagnosis of HIV was made either at husband's illness/death (48.2 percent) or at the time of pregnancy or delivery (24.7 percent). Most patients were asymptomatic (free from major illness) at the time of enrollment, although a third had a history of tuberculosis treatment.

People living with HIV/AIDS may experience a variety of symptoms during the course of the disease. These could interfere with dietary intake and ultimately nutritional status. Often a person may have two or more of these conditions at the same time. Presence of some symptoms may be due to HIV infection or opportunistic infections and/or due to side effects of medicines. Table 1 summarizes symptoms/conditions reported/observed during interaction with participants at the time of baseline interview.

Table 1: Existing Symptoms /Conditions of Participants at Baseline

Sr. No	Symptom/condition	Frequency (%)
1	Nausea / Anorexia	51(30.0%)
2	Vomiting	21(12.4%)
3	Fatigue, tiredness	65(38.2%)
4	Anaemia	33(19.4%)
5	Breathlessness	21(12.4 %)
6	Diarrhoea	20(11.8)
7	Constipation, bloating,	7(4.1%)
8	Chewing/swallowing difficulty	15(8.8%)
9	Tuberculosis(Recovery stage)	24(14.1%)
10	Skin infections/Darkening/Black spots/Rash	24(14.1%)
11	Oral Thrush/Candidiasis/mouth ulcers	12(7.1%)
12	Fever	27(15.9%)
13	Headache	62(36.5%)
14	Backache/pain in legs	58(34.1%)
15	Pain/Numbness/stiffness of Extremities	28(16.5%)
16	Weight Loss	5(2.95)

continued...

Sr. No	Symptom/condition	Frequency (%)
17	Stomachache	10(5.9%)
18	Sleep Disturbance	33(19.4%)
19	Poor eyesight	4(2.4%)
20	Cold, cough, sore throat	22(12.9%)
21	Gynecological problems (white discharge, ammenhorea, excess or less bleeding & irregular periods)	96(56.5%)
22	Herpes	3(1.8%)

Source: Primary data of authors.

2. Antiretroviral treatment (ART)

In the present study, a large majority of participants (77.1 percent) were on ART out of which 97.8 percent were on 1st line treatment and 3 percent were on 2nd line treatment. Among those who received 1st line treatment, 68 percent were receiving ZLN (Zidovudine, Lamivudine and Nevirapine), 23.4 percent were receiving SLN (Stavudine, Lamivudine and Nevirapine) and the remaining were receiving other combinations. Both these drugs are known to have certain side effects.

2.1 Duration of ART

A majority of the participants (41.2 percent) were on ART for a period of less than one year; with 14.5 percent being on ART for 1–3 years, 39 (29.8 percent) for 3–5 years and 13.7 percent for 5–10 years, with one person being on ART for the last 13 years.

2.2 Side effects of ART

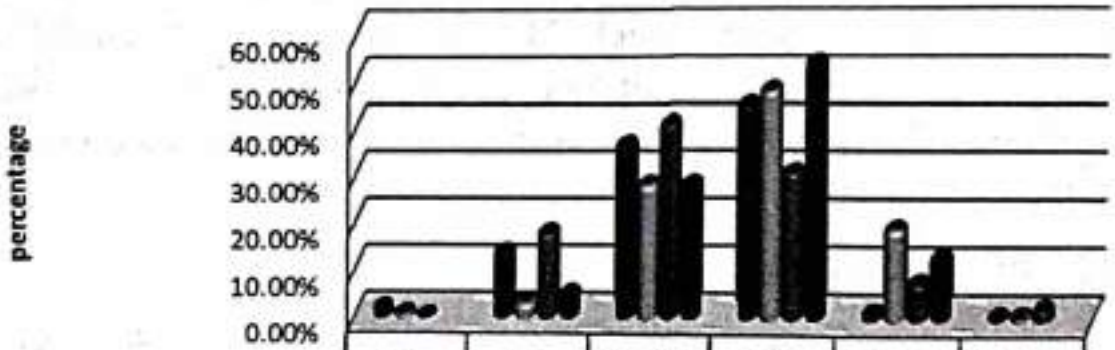
Ninety-four participants reported side effects of ART like nausea, vomiting, anorexia (39.4 percent), skin rash (24.5 percent), fat loss and/or fat gain (51.1 percent), bad dreams (3.2 percent), fainting (5.3 percent), anemia (24.5 percent), numbness, tingling or burning of extremities (45.7 percent).[3] Eight women also showed swollen nerves on hands, headache and menstrual irregularities.

3. Food Habits and Dietary Patterns

3.1 Dietary practices of participants

More than half of the participants (56.5 percent) were non vegetarian, with a poor frequency of consumption of flesh foods (once a week). Majority (74.7 percent) consumed three meals daily that included breakfast, lunch and dinner. Overall, the meal patterns and the composition of menu indicated nutritional inadequacies both in terms of quality and quantity. Subjects reported higher dependency on starchy staples while income elastic foods like flesh foods, milk & milk products and fruits and vegetables that play vital immunity and protective roles were inadequately consumed (Figures 2 and 3). Majority of the participants (80 percent) did not have sufficient awareness of nutritious diet.

Figure 2: Frequency of Consumption of Roots, Tubers and Other Vegetables



	4-5/week	2-3/week	1/week	1/15 days	1/Month	Rarely
ART Roots & Tubers	2.30%	13.70%	36.60%	45.00%	1.60%	0.80%
ART Other Vegetables	0.80%	3.10%	28.20%	48.10%	19.00%	0.80%
NART Roots & Tubers	0.00%	17.90%	41.00%	30.80%	7.70%	2.60%
NART Other Vegetables	0.00%	5.10%	28.20%	53.80%	12.90%	0.00%

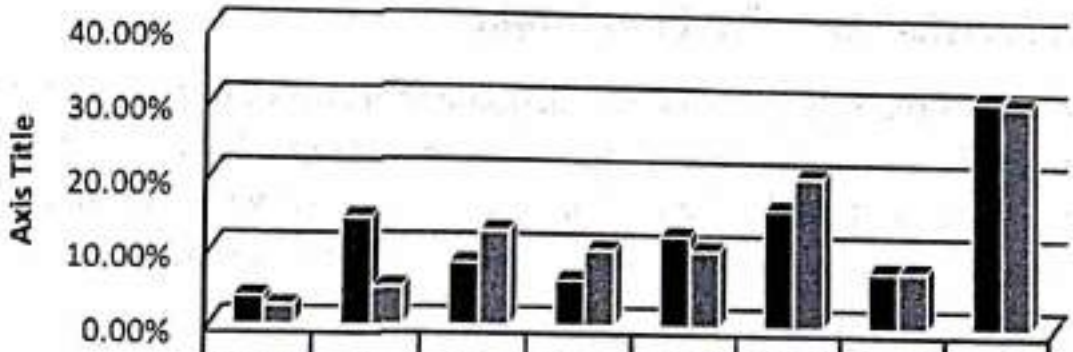
Source: Primary data of authors.

3.2 Consumption of animal foods

In the present study, daily average milk consumption by the participants was very poor (Mean 55.4 ml; ART 60 ml and NART 40 ml). ICMR 2010 recommends at least 200 ml of daily milk consumption as a part of balanced diet by Indian women (see

Gopalan et al 2010). Only 6 and 21 participants reported to consume milk/buttermilk/curd daily and 4–5 times/week respectively. A significant difference ($p<0.05$) was observed among ART and NART group with frequency and quantity of milk consumption being higher for those on ART (Fig 3). The reasons cited for the poor milk intake were cost, intolerance and dislike. Our country is the largest producer of milk in the world yet its consumption remains poor. Efforts must be made to make milk and milk products available to PLHA at concessional rate.

Figure 3: Frequency of Milk and Milk Product Consumption



	Daily	4-5/week	2-3/week	1/week	1/15 days	1/Month	Rarely	Nil
■ ART	3.80	14.5	8.40	6.10	12.2	16.0	7.60	31.4
■ NART	2.60	5.10	12.8	10.3	10.3	20.5	7.70	30.7

Source: Primary data of authors.

3.3 Ready to eat foods

A small percentage (6 percent) purchased and consumed ready to eat freshly prepared snack foods on regular basis. About 14.1 percent and 28.8 percent participants consumed such foods once in a fortnight and once in a month respectively. However, biscuits and bread were consumed by a majority (35.3 percent) at least 2–3 times a week. It was observed that 10 and 25 participants consumed bread/biscuits daily and 4–5 times /week respectively.

3.4 Consumption of roadside 'street' food

Less than 25 percent of the participants consumed roadside food once in 10–15 days. When they consumed roadside food it was mainly "*vada-pav*"; Mumbai's favourite street food. Overall, it can be concluded that the diets of WLHA were poor in terms of inclusion of foods items from different food groups reflecting possible nutrient inadequacies. A study; The SMART/EST Women's project (Stress Management and Relaxation Training/Expressive-Supportive Therapy) by Segal-Isaacson et al (2006) indicated that dietary patterns of all the participants improved after nutrition intervention in form of nutrition education.

3.5 Satisfaction with food intake

In spite of their diets not being adequate in terms of nutrient intakes and food groups 80 percent of the respondents reported to be satisfied with their food intake. Five subjects could not answer this question. The remaining 29 were dissatisfied about their food intake.

4. Meal Patterns and Typical Menu

Meal patterns and the composition of menu indicated nutritional inadequacies both in terms of quality and quantity. Frequency of meal consumption indicated that lunch and dinner were consumed by almost all the participants on a regular basis. A vast majority (87.06 percent) consumed breakfast daily. A small percentage consumed mid morning (4.1 percent) and evening snacks (8.2 percent) on daily basis. Tea was a most favored beverage and was consumed twice in a day by the two-third of the participants.

4.1 Breakfast

Breakfast is most important meal of the day contributing to approximately 1/3rd to 1/4th of daily energy and other nutrients. Breakfast was included by many after the initiation of ART as the medicines were required to be consumed in the morning after having food. A significant difference was seen among ART and NART group with regard to daily breakfast consumption ($p<0.05$).

It was observed that 92.4 percent on ART and 69.2 percent NART consumed breakfast daily. Twelve reported consuming breakfast 2–3 times in a month, seven among them being from NART group.

4.1.1 Typical menu for breakfast

Almost half the participants (50.6 percent) consumed tea with *roti*/biscuits/*pav* for breakfast. Around 12 women reported consuming one entire pack of glucose biscuits for breakfast at least twice a week. Almost 21.2 percent consumed *upma/idli-sambar/poha/batata* or *medu vada* for breakfast, 11.2 per cent consumed *roti+sabji* or *rice+dal*. Eight participants said they usually skip breakfast or have just a cup of tea. Except for a small percentage (8.8 percent) all consumed breakfast 2–4 hours after waking up in the morning.

4.2 Lunch

Lunch was another important meal of the day consumed by almost all (96.7 percent) of the participants daily. The lunch included *roti /bhakari* or rice with *sambar/dal* or vegetable/*usal* (curry prepared with sprouted legumes). Flesh foods were consumed daily only by a small percentage (6.5 percent). There was no significant difference in type of menu or frequency of lunch consumption among ART and NART groups (Table 2).

Table 2: Typical Menu for Lunch

Typical Menu	ART/NART (frequency & %)		Total
	ART	NART	
Roti/bhakri+Veg+rice+Dal/ Sambhar	42 (32.1%)	19 (48.7%)	61 (35.9%)
Roti/bhakri/Rice+Veg/usal	47 (35.9%)	9 (23.1%)	56 (32.9%)
Rice/Roti+Dal/Sambhar	33 (25.2%)	9 (23.1%)	42 (24.7%)
Roti/rice/bhakri+non-Veg	9 (6.9%)	2 (5.1%)	11 (6.5%)
Total	131 (100%)	39 (100%)	170 (100%)

Source: Primary data of authors.

4.3 Dinner

Dinner is often considered to be the most important meal of the day by many Indians as the entire family is together. Although it should be a lighter meal, for most Indians it provides almost half to one-third calorie requirement (Swaminathan et al 2008). Except for one, all participants consumed dinner daily. Little less than half (47.1 percent) had *rice+roti/bhakari+dal+vegetable* daily and was referred to as 'complete meal' by almost half of them. The menu was similar to lunch. A higher percentage of participants preferred to include non-vegetarian items in dinner than in lunch. The frequency of flesh foods consumption during dinner was significantly higher among ART users than NART (Table 3).

Table 3: Typical Menu for Dinner

Typical Menu	ART/NART (Frequency & %)		Total
	ART	NART	
Roti/bhakri+Veg+rice+Dal/ Sambhar	62(47.3%)	18(46.2%)	80(47.1%)
Roti/bhakri/Rice+Veg/usal	22(16.8%)	5(12.8%)	27(15.9%)
Rice/Roti+Dal/Sambhar	25(19.1%)	12(30.8%)	37(21.8%)
Roti/rice/bhakri+non-Veg	22(16.8%)	4(10.3%)	26(15.3%)
Total	131 (100%)	39 (100%)	170(100%)

Source: Primary data of authors.

4.4 Snacks

Consumption of mid morning and evening snacks daily was very poor (4.12 percent and 8.24 percent respectively). The 'most-liked' food item among those who consumed snacks was a street food '*vada-pav*'.

4.5 Morning and afternoon tea

Tea is a favourite and refreshing drink liked by most Indians. Almost all participants consumed morning tea. Eighteen participants consumed tea without milk while 58 added just a

tablespoon (15 ml) of milk. 103 (60.6 percent) consumed tea in the afternoon too. Thirty nine participants consumed 3–4 cups daily due to persistent headache and because of nature of job (domestic worker) where they received tea from the employer. Two participants each consumed coffee and milk.

5. Daily Dietary Nutrient Intake (24-hour recall)

Dietary macro and micro nutrient intake as assessed by 24-hour recall method was significantly different between participants on ART and NART (Table 4) with the intake much lower among both the groups than the Recommended Dietary Allowances (RDA). Those on ART had higher intakes of all the nutrients possibly because of inclusion of 3 meals by a majority.

Table 4: Daily Nutrient Intakes of Participants (ART/NART)

Nutrient	ART/ NART	N	Mean±SD	Overall Mean	Range	Sig. (2-tailed) P	RDA (WHO 2004 guidelines) & ICMR 2010
Calories (Kcal)	ART	131	1106+250	1083	278-1898	.034*	2450
	NART	39	1006+282				
Proteins (gms)	ART	131	33.0+7.0	31.8	12.6-57.9	.004*	55
	NART	39	29.0+6.0				
Fats (gms)	ART	131	20.0+6.0	19.6	4.3-43.1	.021*	30
	NART	39	18.0+5.0				
Carbohydrates (gms)	ART	131	198+53	194.8	47-410	.114	365
	NART	39	183+59				
Calcium (mgs)	ART	131	204.3+106.6	194.2	11-778	.031*	600
	NART	39	160.2+127.1				

continued...

Nutrient	ART/ NART	N	Mean±SD	Overall Mean	Range	Sig. (2-tailed) P	RDA (WHO 2004 guidelines) & ICMR 2010
Iron (mgs)	ART	131	10.5+4.3	10.2	3.4-24.8	.183	21
	NART	39	9.4+4.2				
Zinc (mgs)	ART	131	4.6+1.7	4.4	1.8-12.4	.038*	10
	NART	39	4.0+1.5				
β carotene (mcg)	ART	131	677.0+795.5	662.8	61.6-3786	.664	4800
	NART	39	615.2+716.1				
Vitamin-C (mgs)	ART	131	18.9+15.5	18.4	1.6-83.4	.452	40
	NART	39	16.9+9.6				

*Significant (P< 0.05)
Source: Primary data of authors.

5.1 Nutrient Consumption and RDA

Several studies have documented widespread suboptimal intakes of micronutrients in PLHA (Kim et al 2001; Woods et al 2002). From Table 2 it is evident that daily mean intake for all nutrients was significantly lower than Recommended Dietary Intakes (RDI) recommended by WHO and RDI for Indians by ICMR (see Gopalan et al 2010) given for normal healthy moderately active Indian women. Seventy-seven participants on ART and twenty-six on NART had met less than 60 percent of RDI for calories, proteins, fats and calcium and less than 50 percent RDI for Vitamin A, Vitamin C, iron and zinc. Only 38 percent ART and 17.9 percent NART participants met 75 to 90 percent RDI for all nutrients except for iron and vitamin A. Twenty subjects on ART and four NART met 90 to 100 percent of RDI for all nutrients except for Vitamin A. Only five subjects on ART and two NART had macronutrient consumption beyond recommended allowances. Several studies conducted by researchers have also

documented widespread suboptimal intakes of micronutrients in people with HIV/AIDS (Kim et al 2001; Semba and Tang 1999; Woods et al 2002). Woods et al (2002) found that 35 percent of the women in their study had intakes less than 75 percent of the RDI for Vitamins A, C, B6 and iron and zinc. The study revealed poor dietary consumption and inadequate nutrient intakes indicating presence of both macronutrient and micronutrient deficiency (hidden hunger). Therefore, it is recommended that long term nutritional interventions, both in terms of food supplementation and dietary counseling need to be initiated by government of India for women living with HIV/AIDS on a large scale.

Conclusion

The study showed that majority of the participants had poor nutritional status as indicated by poor nutrient intakes. While almost a large number of participants were on ART, one third had more than one symptom like nausea, vomiting, diarrhoea, swallowing difficulty, constipation and flatulence, stomachache, headache, fatigue that affected their food intake. Intake of all nutrients for both the groups was lower than the RDA. Addressing gaps in nutrition among people living with HIV/AIDS is therefore essential because nutrition is intrinsically linked to the immune status, and thus plays a vital role in the care and management of HIV/AIDS. Simple affordable supplementary nutrition and counseling may be feasible and may have a positive impact on various nutritional parameters.

NOTES

1. See: AVERT.org, HIV statistics, 2011.
2. See: www.nacoonline.org.
3. Referred to as *Peripheral Neuropathy* – pain due to nerve damage, mostly in the feet and hands.

REFERENCES

Chatterjee, Meera (1990). Indian women: Their health and economic productivity. *World Bank discussion papers 109*, Washington DC.

Dong, K. and Imai C. (2012). Medical nutrition therapy for HIV/ AIDS. In Mahan K.L., Stump - Escott S–Krause (Eds.), *Food, Nutrition and Diet Therapy.* Washington: WB Saunders Company.

Doukas, M.A. (1992). Human immunodeficiency virus associated anemia. *Med Clin North Am* 76: 699.

Fenton, M. and Silverman E. (2003). Medical nutrition therapy for human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS). In Mahan KL, Stump-Escott S-Krause (Eds.), *Food, Nutrition, and Diet Therapy.* Washington: WB Saunders Company, pp 900.

Gopalan, C., Ramasastry B.V., Balasubramanyam S.C., Narasinga Rao B.S., Deosthale Y.G., Panth K.C. (2010). *Nutritive value of Indian foods.* Hyderabad: National Institute of Nutrition (ICMR).

Hendricks, K.M, Mwamburi D. M., Newby P.K. and Wanke C.A. (2007) Dietary supplement use and nutrient intake in HIV-infected persons. *AIDS Reader* 1:12.

Kawai, K., Kupka R., Mugusi F., Aboud S., Okuma J., Villamor E., Spiegelman D., and Fawzi W. (2010). A randomized trial to determine the optimal dosage of multivitamin supplements to reduce adverse pregnancy outcomes among HIV–infected women in Tanzania. *Am J Clin Nutr* 91: 391.

Kim, J.H., Spiiegelman D., Rimmm E., Gorbach S.L. (2001).The correlates of dietary intakes among HIV-positive adults. *Am J Clin Nutr*: 74: 852–61.

Kotler, D.P. (2000). Nutritional alterations associated with HIV infection. *J Acquir Immune Defic Syndr.* 25(Suppl 1): S81–7.

Meda, N, Mandelbrot N, Cartoux M., Dao, B., Ouangre, A. & Dabis, F. (1999). Anaemia during pregnancy in Burkina Faso West Africa 1995-96 Prevalance and associated factors. *Bull World Health Organ* 77(11): 916–922.

Obi, S, Ngozi A., Ifebunandu, Azubuike K. Onyebuchi (2010). Nutritional status of HIV-positive individuals on free HAART treatment in a developing nation. *J Infect Dev Ctries*, 4(11):745–749.

Polsky, B., Kotler D. and Steinhart C. (2001). HIV-associated wasting in the HAART era: Guidelines for assessment, diagnosis and treatment. *AIDS Patient Care and STDs*, 15: 8: 411–423.

Segal-Isaccson, C.J., Jonathan N. Tobin, Weiss S.M., Bronandolo E., Vaghn A., Wang C., Camille J., Gaussse Y., Ishii M., Jones D., La Perriere A., Lydston D., Schneiderman N. and Ironson G. (2006). Improving dietary habits in disadvantaged women with HIV/AIDS: The SMART/EST women's project *AIDS. Behav.* 10(6): 659–670.

Semba, R.D. and Tang A.M. (1999). Micronutrients and the pathogenesis of human immunodeficiency virus infection. *Br J Nutr.* 81: 181–189.

Sullivan, P.S., Hanson D.L., Chu S.Y., Jones J.L. and Ward J.W. (1998). Epidemiology of anemia in human immunodeficiency virus infected persons: results from the multistate adult and adolescent spectrum of HIV disease surveillance project. *Blood.* 91:301–308.

Swaminathan, S., Padmapriyadarsini C., Sukumar B., lliayas S., Ramesh Kumar S., Triveni C., Gomathy P., Thomas B, Mathew M. and Narayanan P.R. (2008). Nutritional status of persons with HIV infection and tuberculosis and HIV negative-individuals from southern India. *Clin Infect Dis*, 46: 946–949.

Woods, M.N., Spiegelman D., Knox T.A., Forrester J.E., Connors J.L., Skinner S.C., Siva M., Kim J.H., Gorbach S.L. (2002). Nutrient intake and body weight in a large HIV cohort that includes women and minorities. *J.Am.Dietet.Assoc* 102:203.

World Health Organization (2003). Nutrient Requirements for people living with HIV/AIDS: *Report of Technical Consultation.* Geneva: WHO.

MIGRATION IN GOA: A STUDY OF WORKERS IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

The construction industry in Goa is dominated by migrant workers. This study examines the socio-economic background of migrant workers, the reasons for migration and the problems faced by the migrants in the construction industry in Goa. The sample of the study consisted of 100 migrant workers in the construction industry from the two districts of North Goa and South Goa. A structured questionnaire comprising of various dimensions (socio-economic background, reasons for migration and the problems faced by migrant workers) was administered to the respondents. The findings of the study revealed that half of the respondents were from Karnataka, majority of them were young, males and literate. Majority of them were employed on contract and were helpers. Their work experience in this industry was limited. The daily wage received by the respondents was higher in Goa than in their native place. There was gender discrimination in the daily wage paid in Goa. Majority of the respondents were not provided with the mandatory facilities at the construction sites.

The three main push and pull factors responsible for migration of the respondents to Goa are related to wages, employment and standard of living. The problems faced by the respondents in Goa were both economic and social.

Keywords: Goa; migration; problems of migration; push and pull factors

Introduction

Migration is a process through which people move from one place of residence to another (Tripathy 2010). According to Mishra and Reddy (2005) the currents of migration generally flow from the area of limited economic opportunities and retarded social development to the developed and the fast developing areas where migrants can expect greater pecuniary gains and consequently a better level of living and an improved socio-economic status.

In-migration has been booming in Goa. The 2001 census indicate that migrants working in the organized and unorganized sectors constitute nearly 4 lakhs of Goa's 13.48 lakhs population. Over four decades, the migrants constitute 33-34 percent of Goa's population.[1] Migrants are an integral part of Goa's economy. The present study is an attempt to investigate various issues of migration in the construction industry in Goa.

Review of Literature

The first recorded migration of the Aryan population had substantial effects on the population, language and culture of the local aboriginal inhabitants of the Konkan region. Following Liberation until the present, two major migration trends occurred in Goa; first, the exodus of young Goan men to work in the Gulf countries or on international shipping lines and second, the influx of families and individuals from neighbouring States within India (Larsen 1998). Many educated and even less-educated Goans favoured out-migration, primarily going abroad seeking better employment opportunities. Migration into Goa was caused chiefly

by major projects and heavy government spending, especially in the 1960s and 1970s, during the first phase of the building of infrastructure in what was until then a stagnant colonial backwater (Sharma 2004). The process of migration, therefore, has been an integral part of Goa's cultural evolution throughout recorded history, though the population and nature of the migration trends evolve and change owing to changing needs and circumstances (Larsen 1998).

It has been observed that at the national level about 2 percent households migrate. In spite of the seemingly small number, it is no doubt a considerable figure in the overall context. The migration of labour households is mainly for seeking employment opportunities (Kamble 2012). Kumar and Sidhu (2005) provided important factors that motivate people to move which they classified into economic factors, demographic factors, socio-cultural factors and miscellaneous factors.

Several studies were undertaken to identify whether economic factors or non-economic factors are the causes for large scale migration from rural areas. Some researchers have indicated the importance of economic factors rather than non-economic factors that are more responsible for inducing migration (Neeta 2003; Rao et al 2004; Sivakumar 2001; all cited in Meena and Selvam 2011). Meena and Selvam (2011) have emphasized that both economic factors and non-economic factors influence migration in one way or the other. Migration is the outcome of the relative strength of push and pull factors that seem to be equally important (Rao et al 2004, cited in Meena and Selvam 2011). In a study by Meena and Selvam (2011) they found that the dominant push factor was lack of employment followed by low wages, heavy debt burden, caste discrimination and family conflict. The most significant push factor was better employment opportunities followed by higher wages. The study also found that both pull and push factors contribute to the large scale migration from Theni District in Tamilnadu. Further the economic factors emerged stronger as compared to the non-economic factors in influencing migration from Theni District. Kamble (2012) in his empirical study found

a number of reasons responsible for labour migration in India, such as employment, studies, marriage, movement of parents and earning member, and others according to the study. The study also found that the migration of backward castes was purely an economic phenomenon followed by geographical causes.

Statement of the Problem

In Goa the construction industry is a booming one. Everyone wants to own a house in Goa due to the scenic beauty, peaceful co-existence of people from various backgrounds and religions and the culture of the State. The investment and demand for second homes has been increasing in Goa. This has placed great pressure in obtaining the required workforce in the construction industry. The shortage of labour within the State and inability to mobilize the locals to work in the construction industry has resulted in the in-migration of workers in this industry to a large extent. The construction industry in Goa is no doubt dominated by migrant workers. It is therefore important to understand the socio-economic background of the migrant workers, the reasons for migration and the problems faced by the migrants in the construction industry in Goa. The study is an attempt to investigate these issues.

Objectives of the Study

The following are the objectives of the study:

1. To examine the socio-economic background of the migrant workers in the construction industry in Goa.
2. To investigate the reasons for in-migration of the construction workers in Goa.
3. To analyze the problems faced by migrant workers in the construction industry in Goa.

Methodology of the Study

Sample

The sample of the study consisted of 100 migrant workers in the construction industry in Goa. These migrant workers were selected from different construction sites in the two districts of North and

South Goa. The respondents consisted of both male and female migrant workers.

Instruments used for Data Collection

The researchers developed a structured questionnaire after referring to various similar questionnaires in journals and the internet. The questionnaire included various dimensions such as socio-economic background of migrant workers, reasons for migration and the problems faced by migrant workers.

Method of Data Collection

Data was collected from both primary and secondary sources for the purpose of the study. Primary data was collected through field survey using the interview method. The researchers interviewed each migrant labourer. Every respondent was explained each question in the questionnaire and their responses were noted. The secondary data was collected from books, journals and the internet.

Findings of the Study

1. Socio-Economic Background of the Migrant Workers in the Construction Industry in Goa

The *socio-economic background* of the respondents (N=100) in the construction industry in Goa was analyzed. It included various facets such as. their native place, age, gender, marital status, educational qualifications, work skill, years of experience, daily wages, type of employment, facilities provided at the construction site, and standard of living.

a. Native place of the migrant workers in the construction industry in Goa

The magnetism of the construction industry to attract migrants from other States has been going on for over a decade in Goa. The native place of the respondents would reveal the various States from which these migrants are attracted to Goa. Table 1 illustrates the native place of residence of the respondents.

Table 1: Native place of construction workers in Goa (N=100)

Native place	Total (percent)
Karnataka	50
Bihar	11
Orissa	8
Uttar Pradesh	8
Bengal	8
Maharashtra	6
Assam	3
Madhya Pradesh	3
Rajasthan	3

Source: Primary data

From Table 1 it can be observed that the respondents (N=100) are from eight States in India. While half the respondents (50 percent) were from Karnataka, very few were from other States like Bihar (11 percent), Orissa (8 percent), Uttar Pradesh (8 percent), Bengal (8 percent), Maharashtra (6 percent), Assam (3 percent), Madhya Pradesh (3 percent) and Rajasthan (3 percent). It is evident from the findings that migrant workers in the construction industry in Goa have migrated mainly from Karnataka. This perhaps may be because Karnataka is the neighbouring State, closer to Goa and being well connected by rail and road.

b. Age of the migrant workers in the construction industry in Goa

The age composition of the respondents (N=100) is revealed in Table 2. It is interesting to note that majority of the migrant construction workers fall in the young age group of 18-29 years (52 percent). This is followed by the age group of 30-40 years (37 percent), while very few of the respondents belong to the middle age and older age groups of 41 to 50 (9 percent) and 51+ (2 percent).

Table 2: Age of migrant workers in the construction industry in Goa (N=100)

Age	Total (percent)
18-29	52
30-40	37
41-50	9
51+	2

Source: Primary data

c. Gender of the migrant workers in the construction industry in Goa

The gender of the respondents (N=100) as revealed in Table 3 shows that 80 percent of the migrant construction workers are males with the rest being females (20 percent). The results thus show that to a large extent it is the males that predominantly work in the construction industry in Goa.

Table 3: Gender of migrant workers in the construction industry in Goa (N=100)

Gender	Total (percent)
Male	80
Female	20

Source: Primary data

d. Marital Status of the migrant workers in the construction industry in Goa

The marital status of the respondents as shown in Table 4 reveals that 60 percent of the migrant workers are married whereas 40 percent are unmarried. Thus majority of the respondents are married.

Table 4: Marital status migrant workers in the construction industry in Goa (N=100)

Marital status	Total (percent)
Married	60
Unmarried	40

Source: Primary data

e. Educational qualifications of the migrant workers in the construction industry in Goa

The next attribute of the respondents analyzed was their educational qualifications. Table 5 reveals that overall a large majority of the respondents are literate (92 percent) but their educational qualifications are very low. Majority of them are educated upto the primary level (63 percent), while few of them have completed their SSC (25 percent), very few of them had passed HSSC (4 percent) and none of them are graduates. Only 8 percent of the respondents are illiterate with no formal education. Thus though majority of the respondents are literate they have a low level of formal education and very few of them are illiterate. Similar result was found in a study by Kamble (2012).

Table 5: Educational qualifications of migrant construction workers in Goa (N=100)

Educational qualifications	Total (percent)
Primary	63
SSC	25
HSSC	4
Graduate	0
Illiterate	8

Source: Primary data

f. Occupation of the migrant workers in the construction industry in Goa

The occupation of the respondents in the construction industry was examined and the results are disclosed in Table 6. It can be observed that majority of the respondents (58 percent) work as helpers in the construction industry in Goa. Few of them work as stone masons (23 percent), while very few of them work as supervisors (7 percent), load and unload material (3 percent), are private contractors (4 percent) and finishing and designing workers (5 percent). It can be concluded that majority of the respondents work as helpers in the construction industry in Goa and are therefore unskilled workers.

Table 6: Occupation of migrants in the construction industry in Goa (N=100)

Occupation of respondents	Total (percent)
Helpers	58
Stone masons	23
Supervisors	7
Loading/unloading	3
Private contractors	4
Finishing and design	5

Source: Primary data

g. Work experience of migrant workers in the construction industry in Goa

The work experience of the respondents in the construction industry was also analysed. Table 7 reveals the work experience of the respondents in the construction industry in Goa.

Table 7: Work experience of respondents in the construction industry in Goa (N=100)

Years of working experience	Total (percent)
Less than 5 years	46
5 –10 years	45
11–15 years	7
16+	2

Source: Primary data

From Table 7 it can be noticed that many of the respondents (46 percent) have been working in the construction sector for less than 5 years, followed by 5 to 10 years (45 percent). Very few of them have been working in this industry for over 11 years in Goa. It can be concluded that the respondents do not have many years of experience in the construction industry in Goa (with one possible reason for the same being shifting to jobs involving other industries).

h. Wages of migrant workers in the construction industry in Goa

In the construction industry in Goa migrant workers receive daily wages. The statutory daily wage in Goa is Rs. 285/-. Table 8 demonstrates the daily wages earned by the respondents (N=100), including those earned by male (N=80) and female respondents (N=20). It can be realized that for the total sample most of them earned a daily wage in the range of Rs. 301 to Rs. 500 (62 percent), while very few of them earned a daily wage between Rs. 100 to Rs. 300 per day (26 percent) and Rs. 500 above (12 percent). None of the respondents earned a daily wage below Rs. 100. Thus majority of the respondents earned a daily wage that is higher than the minimum daily wage offered in Goa.

Table 8 also draws a *gender comparison* on the daily wage earned in the construction industry in Goa. The results show that there is gender discrimination in the daily wages paid. Majority of the female respondents (55 percent) received daily wages between

Rs. 100 to Rs. 300 while only few of the male counterparts (18 percent) received such an amount as daily wage. On the other hand majority of the male respondents (68 percent) received daily wages between Rs. 301 to Rs. 500 compared to the female counterparts (40 percent). None of the female respondents received daily wages beyond Rs. 500. Thus the male respondents received higher daily wages compared to the female counterparts. Thus there exists gender discrimination in the payment of daily wages in the construction industry in Goa.

Table 8 also draws a *comparison between the daily wages received by the migrant workers in their native place and in Goa* (N=100). The findings reveal that in their native place, all the respondents (N=100) earned very low daily wage compared to the daily wage they received in Goa. The daily wage in their native place is in the range of below Rs. 100 to Rs. 200. The daily wage received in their native place is much lower (not beyond Rs. 200) compared to the daily wage they earned in Goa. Thus the daily wage received by migrant workers in the construction industry in Goa is relatively higher than in their native place.

Table 8: Comparison of daily wage of migrant workers in the construction industry in Goa (N=100) (Figures in bracket show percent)

Daily wages earned in Goa (Rs)	Female (20)	Male (80)	Total (percent)	Daily wage earned in the native place (percent)
Less than 100	0 (0)	0 (0)	0	48
100-200	5 (25)	2 (3)	7	52
201-300	7 (35)	12 (15)	19	0
301-400	6 (30)	35 (44)	41	0
401-500	2 (10)	19 (24)	21	0
500+	0 (0)	12 (15)	12	0

Source: Primary data

i. Employment term of migrant workers in the construction industry in Goa

The employment term of the migrant workers in the construction industry in Goa was also investigated, that is whether the respondents are employed on contract, regular, casual or permanent basis. Table 9 reveals the results.

Table 9: Employment of the migrant workers in the construction industry in Goa (N=100)

Employment	Total (percent)
Contract	58
Regular	24
Casual	18
Permanent	0

Source: Primary data

The findings reveal that majority of the respondents (58 percent) are employed on contract basis. Some of them are regular workers (24 percent) while few of the respondents are employed as casual workers (18 percent). None of them are employed as permanent workers since the construction industry has a floating population. Thus in the construction industry in Goa majority of the migrant workers are employed on contract.

j. Facilities provided to migrant workers at the construction site

The researchers investigated the facilities provided to the migrant workers by the employer at the construction site. Table 10 reveals the results. Some of the respondents disclosed that housing facilities (44 percent) and safety measures (43 percent) were provided at the construction site by the employer. This implies that majority of the respondents in the construction industry (over 50 percent) are not provided with safety measures and housing facilities by their employer even though these facilities are mandatory. Moreover very few of them were provided with basic amenities like electricity

(21 percent), water supply (16 percent), toilets (7 percent) and transport (5 percent) at the construction site. Thus majority of the migrant workers in the construction industry are often deprived of basic utilities at the construction sites in Goa.

Table 10: Facilities provided to migrant workers at the construction site (N=100)

Facilities provided by the contractor	Total (percent)
Housing	45
Safety measures	43
Electricity	21
Water	16
Toilets	7
Transport	5

Source: Primary Data

k. Standard of living of migrant workers in the construction industry in Goa

The standard of living of migrant workers in the construction industry in Goa was examined on the basis of their household possessions. The results can be observed in Table 11.

Table 11: Standard of living of migrant workers at the construction industry in Goa (N=100)

Standard of Living	Total (percent)
Mobile	100
Television	67
Kerosene Stove	49
Cycle	44
LPG	41
Kitchen appliances	26
Scooter/Bike	24

Source: Primary Data

The findings show that all the respondents (N=100) owned a mobile. Majority of them owned a television (67 percent). Some of them had a kerosene stove (49 percent), a cycle (44 percent) and an LPG connection (41 percent). Few of them owned kitchen appliances (26 percent) and a scooter/motorbike (24 percent). From the findings it can be implied that majority of the respondents do not have a low standard of living.

2. Causes of Migration of Construction Workers to Goa

There are various factors-push and pull-that result in migration of workers. Push factors are those that compel a person due to different reasons, to leave the place and go to some other place. Pull factors refer to those factors that attract the migrants to an area (Hussain et al 2004). The push and pull factors responsible for the migration of construction workers to Goa was investigated by the researchers.

a. Push factors of migration of construction workers to Goa

Various push factors have lead to the migration of workers in the construction industry from the other States to Goa. The results can be observed in Table 12.

Table 12: Push factors of migration of construction workers to Goa (N=100)

Push Factors	Total (percent)
Low wages	100
Unemployment	72
Poor working conditions	67
Poor living conditions	59
Poor infrastructure	27
Lack of education facilities	7
Natural calamities	6
Political factors	3

continued...

Push Factors	Total (percent)
Religious disharmony	2
Social harassment	2
Family disputes	1
Pollution	0

Source: Primary Data

From Table 12 it can be observed that all the respondents revealed that low wages in their native place was the main push factor for migration. Earlier Table 8 had revealed that the respondents received low daily wage in their native place compared to Goa. Thus low wages in the native place is a major push factor of migration for the respondents. Besides low wages in their native place, a large majority of respondents perceived three other push factors as main reasons for migration to Goa, namely unemployment (72 percent), poor working conditions (67 percent) and poor living conditions (59 percent). Some of the respondents identified poor infrastructure (27 percent) to be another push factor that led them to migrate to Goa. The other push factors that very few of the respondents considered to be a cause for migration were lack of education facilities (7 percent), natural calamities (6 percent), political factors(3 percent), religious disharmony (2 percent), social harassment(2 percent), and family disputes (1 percent). None of them considered pollution in their State to be a push factor for migration. Thus the most important push factors that caused the respondents to migrate to Goa were low wages, unemployment, poor working conditions and poor living conditions in their respective States. Similar findings were observed in studies by Kamble (2012) and Meena and Selvam (2011).

b. Pull factors of migration of construction workers to Goa

The pull factors that attracted the respondents to Goa from their respective States are revealed in Table 13.

Table 13: Pull Factors of migration of construction workers in Goa (N=100)

Pull Factors	Total (percent)
Higher wages	100
Employment opportunities	73
Better standard of living	64
Better working conditions	41
Better living conditions	33
Better infrastructure	20
Better education for children	16
Peaceful conditions	10
Migration due to marriage	1

Source: Primary Data

Table 13 illustrates that the three major pull factors that attracts the respondents to Goa are higher wages (100 percent), employment opportunities (73 percent) and a better standard of living (64 percent) offered in Goa. The other pull factors perceived by some of the respondents were better working conditions (41 percent), better living conditions (33 percent), better infrastructure (20 percent), better education facilities for children (16 percent), peaceful conditions (10 percent) and migration due to marriage (1 percent). Thus the major push factors that attracted the respondents to migrate to Goa were higher wages, employment opportunities, and better standard of living.

The push and pull factors are both causes responsible for the migration of the respondents in the construction industry in Goa. Similar results were found by other researchers (Kamble 2012; Meena and Selvam 2011). In this study the three main push and pull factors of migration are associated with wages, employment and standard of living.

Furthermore the researchers inquired from the respondents if they would prefer to stay in Goa or return to their native place. Table 14 reveals the results, wherein majority of the respondents

(92 percent) preferred to stay back in Goa while only a few of them (8 percent) preferred to return to their native place.

Table 14: Preference to stay in Goa by migrant workers in the construction industry (N=100)

Preference to stay in Goa	Total (percent)
Yes	92
No	8

Source: Primary Data

Thus majority of the migrants in the construction industry in Goa, as revealed by the results, prefer to stay in Goa and not go back to their native place. This perhaps could be due to the push and pull factors perceived by the respondents.

3. Problems of Migrant Workers in the Construction Industry in Goa

The researchers further investigated the problems faced by the respondents in Goa. Table 15 reveals the different problems encountered by the migrant workers in the construction industry in Goa.

Table 15: Problems faced by migrant workers in the construction industry in Goa (N=100)

Problems faced in Goa	Total (percent)
No toilets	93
High rents	91
High prices	90
Lack of water	84
Lack of electricity	79
Lack of housing	55
Discrimination by locals	17
No schooling facilities for children	0

Source: Primary Data

The findings in Table 15 reveals that the major problems faced by majority of the respondents include lack of sanitation (93 percent), payment of high rents (91 percent), high prices for essential goods (90 percent), lack of safe drinking water (84 percent), no electricity (79 percent) and lack of proper housing facilities (55 percent). Very few of the respondents faced discrimination by locals (17 percent) and none of them felt that there was lack of education facilities for their children. Thus the problems faced by the respondents in Goa were economic and social in nature.

Conclusion

The construction industry in Goa to a large extent comprises of migrant labour. The various push and pull factors of migration have played an important role in attracting migrant workers in the construction industry in Goa. High wages, employment opportunities, better standard of living attracts migrant workers to Goa. There are various economic and social problems that the migrant workers in the construction industry in Goa have to encounter. However inspite of these problems the respondents prefer to stay in Goa rather than return to their native place, perhaps due to the interplay of the push and pull factors. So long as the real estate industry in Goa is booming, demand for homes and second homes are on the rise and the locals are not interested in seeking employment in this industry, migration of workers will increase in the construction industry in Goa.

NOTE

1. Retrieved from: nchro.org/index.php?option=com_content&id=3017:migrants-in-goa. Retrieved on 08/10/2014

REFERENCES

Hussain, Shabbir, Siddiqui Badar Naseem and Hassan Muhammad (2004). A sociological study of factors responsible for migration: A case study of Faisalabad city (Pakistan). *International Journal of Agriculture and Biology.* 6: 683–685

Kamble, P.S. (2012). Labour migration among backward castes in India. *Southern Economist.* February 20: 39–44.

Kumar, Naresh and Sidhu, A.S. (2005). Pull and push factors in labour migration. *Indian Journal of Industrial Relations.* October 41: 221–232.

Larsen, K. (1998). *Faces of Goa.* New Delhi: Gyan Publishing House.

Meena, M. and Selvam, K. Arul (2011). Determinants of rural migration in Theni District. *Southern Economist.* September 50: 44–48.

Mishra, R. and Reddy, A.R. (2005). Factors affecting migration from rural Bihar. *Economic Affairs.* April-June 50: 98–104.

Neeta, N. (2003). Migration for domestic work: Women domestic in Delhi. *Land and Development.* December 9: 118–135.

Rao, Appa. Ramachandrudu, Rao, Subba N. (2004). Rural out migration in a low population growth setting. *Census 2001 and Human Development in India.* 116-127. New Delhi: Serial Publications.

Sharma, Ravi. (2004). The history of migration. *Frontline.* November–December 21.

Sivakumar, M.N. (2001). Selectivity in rural-urban migration: Evidence from Tamil Nadu. *Man and Development.* March 23: 57–68.

Tripathy, S. N. (2010). Problems of tribal migration: A study of KBK district of Orissa. *Vision.* 25: 54–59

IMPACT OF AQUACULTURE FARMING ON GOAN ECOLOGY

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ABSTRACT

Today, aquaculture plays an important role in bringing about economic development, social equity and food security in our society, however, the challenge lies in conducting this activity in an environmentally and socially sustainable manner. Aquaculture practices begin to impact the environment right from the time of land development for construction of ponds and this impact carries on through all the aquaculture operations that are subsequently performed. Such large scale development of land adversely affects the vegetation existing in the area, leads to depletion of water resources, changes in land use pattern, soil erosion, strain on resources, large scale pollution of the surrounding areas and resettlement/rehabilitation of populace. Goa offers several advantages for successful development of aquaculture operations in a scientific and socially acceptable manner, however, numerous challenges with respect to environment protection have to be analyzed and overcome to make it both ecologically and socially sustainable. This study is an attempt to detail the impact of aquaculture on the Goan environment through a SWOT analysis keeping in perspective the fact that aquaculture produce is a good source of proteinous food, in addition, to its huge business potential which offers very attractive returns to the farmer and is a good earner of valuable foreign exchange, through exports.

Keywords: aquaculture; CRZ; ecology; eutrophication; sustainable

Since ancient times, man has been acquiring his resources both from the land and the seas. Fishing, the capturing of natural livestock from aquatic environments, has been going on long before the beginning of recorded history. Besides fishing, ancient man also depended on aquaculture as a source of food. Ancient cultures in China, Japan and to the Far East have practiced traditional aquaculture since 500 B.C. Aquaculture activities and facilities are documented in the art and literature of ancient Far East. While 'aqua' in Latin, means water, 'aquaculture' is the science and art of cultivating aquatic organisms and their processing and marketing (Wheaton 1977).

The world population is projected to top the 8 billion mark by the year 2025 and food shortages are expected to occur frequently. Aquaculture produce can become a reliable solution to solve this problem, as it is source of inexpensive protein rich food. Besides, aquaculture is also employment generating and a very good earner of invaluable foreign exchange, through exports. The Government of India is promoting aquaculture actively to attract more entrepreneurs into this industry, which commands a 15 percent market share globally (Wheaton 1977).

Aquaculture in Goa

The state of Goa is a tiny paradise on the western coast of India having a 104 kms. long coastline, 250 kms. length of inland waterways and a fairly large number of lakes, tanks and ponds. As aquaculture was steadily growing along the coastal areas of India, Goa's aquaculture industry came into being with the setting up of Hindustan Prawns in Bardez Taluka in 1991, the Brackish Water Farmers Development Agency (BFDA) and Marine Products Export Development Agency (MPEDA) (Dias and Castro 1996).

Goa has 1,200 hectares of khazan lands and approximately 3,500 hectares of marshy areas, which could be used for conversion

into aquaculture farms. The BFDA opines that Goa's topography is ideal for shrimp farming activities, as the seawater is regulated based on high and low tides and the quantum of flooding is almost negligible. Further, Goa has a good tidal amplitude as well as spring-tides, which extend up to 40 kilometers inland, this in turn facilitates natural flushing and moreover, there are no turbulences and fast currents (Dias and Castro 1996).

Goa's climate, undulating topography and large number of water bodies offer several advantages and opportunities for successful development of aquaculture operations in a scientific and socially acceptable manner, however, numerous challenges with respect to environment protection have to be analyzed and overcome to make it both ecologically and socially sustainable.

A majority of the aquaculture farms in Goa have been developed on land which was declared as unsuitable for agriculture. Large tracts of natural salt-pans, which were lying unused and low lying lands, were converted into aquaculture farms. Aquaculture farms mushroomed along the banks of rivers and resulted in destruction of mangroves. The organic effluents from aquaculture farms lead to eutrophication of water bodies, release of toxins, gill choking and complete destruction of the estuarine ecosystem in the surrounding areas.

National Environment Engineering Research Institute, Nagpur (NEERI) scientists opined that Goan rivers were highly contaminated with organic matter, farms showed saline intrusion and that the Coastal Regulation Zone (CRZ) rules were violated by most aquaculture farms in Goa. The Supreme Court ordered all shrimp farms within the Coastal Regulatory Zone to be closed down, however, the Goa Government not being in agreement with the order of the Apex Court has filed a review petition, praying that Goa be excluded from the ban (D'Souza 1997).

Objectives of the Study

1. To study the environmental implications and social costs of aquaculture farms.

2. To do a SWOT analysis on aquaculture operations keeping in mind its vast commercial potential.

Scope of the Study

This paper details the environmental implications, opportunities, threats and social costs of aquaculture, as against the tremendous commercial potential and opportunity on offer through this business.

Research Methodology

Data for this study was collected from both primary and secondary sources.

Primary data: Primary data was obtained by personally interviewing aquaculture farmers from Goa and administering a formatted questionnaire. In addition, knowledgeable persons associated with this industry (scientists, environmentalists etc.) and other stakeholders will be interviewed.

Secondary data: Secondary data was obtained from government publications, Directorate of Fisheries, BFDA, journals, research studies and newspaper articles.

Sample size: Census study of the entire population of 96 farmers.

Limitations of the Study

The authenticity of the study is based on primary data collected and available secondary data. The coverage by means of personal contact may not be exhaustive.

Impact on the Environment

Today aquaculture plays an important role in bringing about economic development, social equity and food security in our society, however, the challenge lies in conducting this activity in an environmentally and socially sustainable manner. New aquaculture practices begin to have an impact on the environment right from the time of developing the land for the purpose of pond construction and this impact carries on through all the

aquaculture operations that are subsequently performed. Modern aquaculture farms take up fairly large areas of available land and the land developments include activities like clearing, leveling, excavation, filling, infrastructure development and other required constructions. Aquaculture operations entail the use of huge quantities of water pumped in from creeks, rivers, sea or other water bodies, also, farm and hatchery operations involve the addition of significant amounts of feed, chemicals and manure into the ponds. The water is then circulated in the ponds and later discharged into the same source (Alvares 2002).

Aquaculture adversely affects the following factors of the environment:

1. *Lowering of water table levels* in the area, leading to drying up of wells due to large scale and indiscriminate utilization of ground water.
2. *Irreversible destruction of vegetation in the area* resulting in soil erosion due to loss of flora and displacement of fauna from their natural habitats. Development of aquaculture farms can be directly linked to the extensive loss of mangroves in the tropical countries like Bangladesh, Ecuador, India, Thailand and Bangladesh. These developments have resulted in massive soil erosion in the area, the result is eroding of coastal land and loss of habitat for a large variety of fish and other marine life forms.
3. *Change in pattern of land use* i.e. conversion of grazing and agricultural lands into aquaculture ponds.
4. *Soil erosion* due haphazard land development and soil pollution as a result of construction spoils.
5. *Resource strain in the area* due to clustering of too many projects and environmental pollution due to large scale of operations. When a large number of farms are aggregated in a particular area, the quantum of waste generated will be very high, this will upset the natural ecological balance and in turn will affect the availability of quality water for culture operations.

6. *Water pollution due to untreated discharge of waste water* from farms, which contain unconsumed feed and chemicals used in the farm/operations, this in turn could become a channel for disease transmission in the surrounding areas and in the pond itself.
7. *Sludge production* due to accumulation of unconsumed feed and decaying of unconsumed feed, exoskeleton (shell) shed during molting, excreta, organic manure and lime. This sludge will be partially discharged along with the waste water and the remainder would accumulate at the bottom of the pond.
8. *Air and noise pollution* due to the use of pumps, aerators and generator sets.
9. *Unauthorized farms* may conduct their aquaculture operations in ecologically sensitive or prohibited areas and cause severe problems for the local community in the area, as well as for themselves, as their activities are unaccounted for and conducted with scant regard for the environment.
10. *Waste from processing plants* is another source of waste related to aquaculture operations. This waste, which also consists of organic matter, needs to be disposed off, systematically (Alvares 2002).

A khazan or estuarine ecosystem needs mangroves to survive and flourish. Mangroves are indispensable as a variety fish, crabs, shrimps and other organisms take shelter in them and utilize mangrove estuaries as a breeding ground, nursery and as a good source of food. Mangroves not only offer protection to a large number of life forms but also prevent soil erosion, water logging, saline banks and sea encroachment by stabilizing the coastal environment. They also transport through their ecosystems dissolved nutrients and organic matter, which enrich the coastal waters (Alvares 2002).

However, some ignorant / unscrupulous shrimp farmers, try to increase the dimensions of their ponds by cutting the mangroves and putting shrimp seeds there. The juvenile shrimps ultimately die as the Ph levels in these areas are extremely low, due to acid sulphate soils, which make the neighboring environment acidic.

Chopping off the mangroves not only results in shrimp seeds death, it hurts the whole ecosystem of the locale and may have large scale repercussions, especially affecting the local fishing community, as the fish and other life forms that formerly inhabited the area cannot take refuge there, this in turn causes fish populations to diminish.

The soil erosion and water logging caused due to destruction of mangroves, ultimately, impacts the shrimp farmers as his ponds get exposed to the direct forces of the river and vagaries of nature.

Loss of the mangroves, which normally serve as natural barriers against tidal and river line currents leads to aquaculture ponds being devastated by the river through flooding and gradual degradation of artificial embankments and bunds, this causes aquaculture farmers to incur high expenditure on building new embankments and additional fortifications to strengthen their pond boundaries and bunds, this fact was established and confirmed during the interviews conducted by us.

If destruction of mangroves continues, aquaculture farmers will not only be jeopardizing their own businesses, but will also gradually be the cause of ruin for the whole village and community.

Today diseases encountered in aquaculture ponds threaten the very survival of this lucrative industry and in a desperate attempt to prevent and treat these diseases farmers use a large quantity of chemicals, antibiotics and pesticides in their ponds. This in turn leads to deterioration of water quality and acts as a major threat to the aquatic life (Alvares 2002).

Data Collection / Study Findings

1. Location of Farms

Table 1

Location area	Number of farms	Percentage
CRZ area	30	31.3
Non-CRZ area	66	68.7
Total	96	100

Source: Primary data

Most of the aquaculture farms (66 nos.) are located in areas outside the CRZ and the remaining 30 nos. are situated within the sensitive Coastal Regulatory Zone area.

2. Water Quality Available for Farm Operations

Table 2

Water quality	Number of farms	Percentage
Good quality	63	65.6
Bad quality	33	34.4
Total	96	100

Source: Primary data

Most of the farmers (63 nos.) are satisfied with the quality of water available for use at their farms and the remaining 33 farmers feel that the quality of water is poor and needs improvement.

3. Complaints of Pollution received from owners of neighbouring fields

Table 3

Complaints received	Number of Farms	Percentage
Yes	28	29
No	68	71
Total	96	100

Source: Primary data

68 nos. of farmers have not received any complaints of pollution or salinity from owners of fields and wells neighbouring their shrimp farms, however, 28 nos. of farmers have received complaints of pollution/ salinity from owners of fields and wells neighbouring their shrimp farms.

4. Most Common Problems Faced by Farmers

Table 4

Most Common Problem	Number of Farmers	Percentage
Diseases in Pond	39	40
Bad Quality Water	29	29
Birds & Temperature fluctuations	15	16
Bad & Unproductive seeds	13	15
Total	96	100

Source: Primary data

A major 40 percent of the farmers said the most common problem they faced was that of diseases in the pond, 30 percent of the farmers were troubled by the bad quality of the available water, 16 percent faced other problems such as birds and temperature fluctuations and 15 percent faced the problem of bad and unproductive seeds.

5. Most Common Diseases Encountered by Farmers

Table 5

Disease Encountered	Number of Farmers	Percentage
White Spot Disease	58	60
Loose Shell Disease	19	20
All Other Diseases	19	20
Total	96	100

Source: Primary data

Majority of the farmers interviewed i.e. 60 percent said that the most common disease afflicting the shrimps in the pond is White

Spot disease. The Loose Shells disease accounted for 20 percent of the diseases and the remaining 20 percent constituted all the other diseases put together such as bacterial infections etc.

SWOT Analysis on Aquaculture

SWOT analysis carried out as a part of this study is intended as an information tool for estimating the potential of aqua farming and providing a total picture of its probable Strengths, Weaknesses, Opportunities and Threats. Some of the points mentioned under the analysis are also available in Venugopal (2005).

Strengths

1. Goa has the ideal topography and climate required for aquaculture operations.
2. Goa has a good tidal amplitude and spring tides, which are extend up to 40 kms inland.
3. Availability of natural and man-made water bodies in rural areas with good potential for achieving high productivity, economic operations, multiple cropping, risk reduction and low rate of environmental degradation.
4. Cost effective aqua farming is possible due to accumulation of organic matter from the village catchment areas and from domestic drainage that enrich water resources with nutrients.
5. Availability of region specific and resource specific technologies.
6. Ready availability of human resources, livestock and agricultural wastes and cheap feed ingredients for shrimps.
7. Participation of common interest groups through equal and shared responsibility that lends strength to and facilitates improved aquaculture operations.

Weaknesses

1. Poor organizational capability of rural farmers on account of pre-existing individual disputes and lack of capable/enterprising community leaders.
2. Rural farmers lack self owned ponds, necessary infrastructure,

material inputs and credit facilities, required for conducting aquaculture business.

3. Farmers may be reluctant to participate in such type of schemes due to inequalities and multi-ownership of community ponds.
4. Weak research-extension linkages.
5. Dual leasing policy, short lease periods, high lease rates, multi-water utilization rights for irrigation and domestic purposes of the jointly owned or community ponds.
6. Vandalism among the village folk and social stigma.
7. Poor facilities for marketing aquaculture produce in the region.
8. Inadequate training facilities at village level, ambivalence towards involvement of women or certain caste groups in aquaculture operations.
9. Low level of cooperation amongst operational agencies, low procedural awareness among the local community members and low commitment or understanding from farmers.

Opportunities

1. Increased aquaculture productivity and contribution towards economic efficiency, environmental sustainability and social equity.
2. Equity in income, employment opportunities, food security and poverty reduction.
3. Judicious utilization of various nutrient-rich water resources, human resources and residual materials at village level for multi-community production at a common place.
4. Adoption of community approach for easy implementation of production, breeding, value addition and marketing produce.
5. Opportunity for landless and resource poor farmers to undertake aquaculture in ponds taken on lease.
6. Rural poor get an equal chance in planning, implementation, monitoring, harvesting, marketing, evaluation, profit sharing and obtaining feedback.
7. Participatory learning by farmers irrespective of sex and age.
8. Empowerment of the rural women and farmers leading to

reduction in migration of aquaculture farmers to other regions as wageworkers.

Threats

1. Reluctance to invest in aquaculture due to large investment needed and short lease policy.
2. Unutilized or under utilized village ponds and lakes get infested with aquatic weeds, thereby providing a breeding grounds for mosquitoes and other pests which may cause health hazards in the village and surrounding areas.
3. Threat to the survival of aquatic flora and fauna due to entry of polluted water from industrial effluents, agricultural surface-runoffs and domestic drainage also contributes to water quality deterioration and sediment quality of the community ponds.
4. Poor water quality cause disease outbreaks in the pond and farm.
5. Increase in frequency of natural disasters such as floods, cyclones and droughts.
6. Decline in per capita crop yield and irregular income generation.
7. Introduction of illegal and indiscriminate means, methods and species.
8. Increased unemployment and labour migration in search of livelihood.
9. Social conflict among villagers due to inequitable incomes generated from aquaculture operations.
10. Violation of CRZ.

Summary / Conclusion

1. Aquaculture plays an important role in bringing about economic development and social equity in our society, however, the main challenge lies in conducting this activity in an environmentally and socially sustainable manner.
2. Goa has a large number of water bodies, undulating topography and climate that is ideal for conducting aquaculture operations, which offer very attractive returns to the farmer. Today

diseases encountered in aquaculture ponds threatens the very survival of this lucrative industry and in a desperate attempt to prevent and treat these diseases, farmers use large quantities of chemicals, antibiotics and pesticides in their ponds, which leads to deterioration of water quality and acts as a major threat to aquatic life.

3. While most of the aquaculture farms are located in areas outside the CRZ, about one-third are situated within the sensitive CRZ area.
4. Majority of the farmers are satisfied with the quality of water available for use at their farms, however, some farmers feel that the quality of available water is poor and needs improvement.
5. Most farmers have not received any complaints of pollution or salinity from owners of fields and wells neighbouring their shrimp farms.
6. The most common problems faced by farmers are diseases in the pond, bad quality of the available water, birds, temperature fluctuations and bad/unproductive seeds.
7. The most common diseases afflicting shrimp ponds are White Spot disease, Loose Shells disease and bacterial infections.
8. The SWOT analysis done as a part of this study can act as an information tool for estimating the potential of aqua farming and for providing a total picture of its probable Strengths, Weaknesses, Opportunities and Threats. It can help an entrepreneur in planning, problem identification, adopting precautionary measures, selecting appropriate technology and in project implementation.
9. Today, there is an urgent need to develop an ecologically sustainable model for aquaculture operations so that the interests of all stakeholders are taken care of and literally speaking, "*We can have the cake (our environment) and eat (aquaculture produce) it too.*"

REFERENCES

Alvares, C. (2002). *Fish, curry and rice – A source book on Goa, its ecology and life-style*, pp 188-190. Revised Fourth ed., Goa: Goa Foundation.

Dias, C. and Castro F. (1996). Prawns culture: Farming from Goan waters. *Herald Mirror*, 15th Dec., 2–3.

D'Souza, J. (1997). Prawn farming: High returns, high damages! Herald, 5th Feb., 4.

Venugopal, S. (2005). *Aquaculture*. Jaipur: Pointer Publishers.

Wheaton, F. (1977). *Aquacultural engineering*. New York: John Wiley & Sons Publications.

FUNGAL SPOILAGE OF FOOD IN GOA AND USE OF PLANT EXTRACTS FOR POTENTIAL REMEDIAL MEASURES

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ABSTRACT

A country like India wastes close to one third of the world's food supply annually owing to its hot and humid tropical climate and less developed infrastructure for storage and transportation. Of this amount an estimated 5–10 percent of food loss is mainly due to the more than 1.5 million different varieties of moulds and fungi that cause fungal spoilage. Consequently, there is an increased interest in the fungal spoilage of foods due to post-harvest diseases particularly those caused by xerophilic fungi, psychrotolerant or psychrophilic fungi, and heat-resistant fungi. The current study focuses on the economics of spoilage of food and investigates the role of external factors in food spoilage by fungi and suggests some simple, natural methods for prevention of spoilage. In accordance with International concerns about food safety due to fungal spoilage and mycotoxin contamination, this study is particularly relevant in today's world, owing to its potential health hazards.

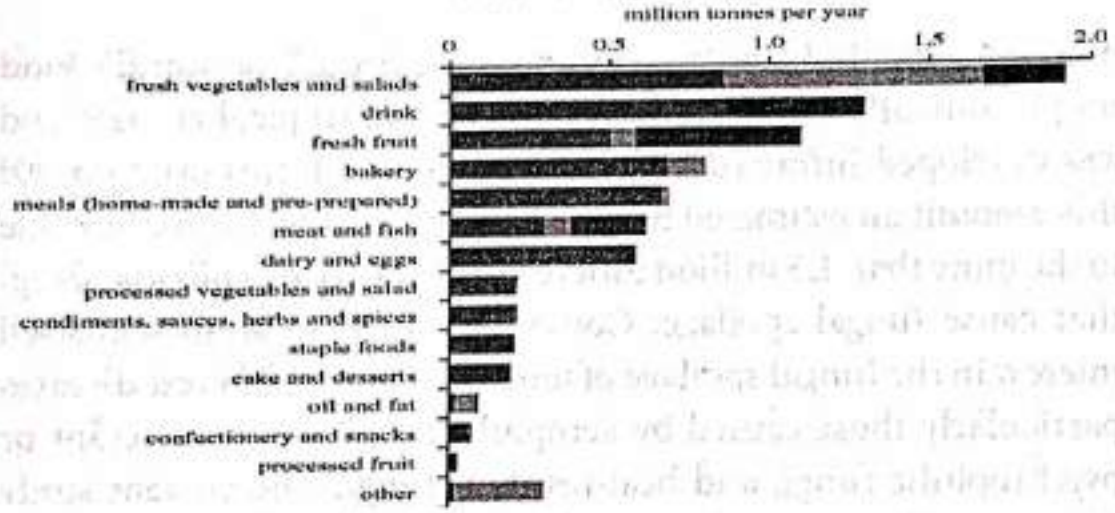
Keywords: factors; food; food-spoilage; fungi; prevention

Introduction

Food by its very nature is expected to be nutritious; therefore in contrast with other great natural systems such as soil, water and plants, food is a rich habitat for microorganisms (Pitt and Hocking 2012). Spoilage is the process by which food deteriorates to the point at which it is no longer edible to humans or its quality becomes compromised. Spoilage of food products can be due to physical, chemical, enzymatic or microbial activities.

Food and Agricultural Organization (FAO) estimates approximately 1.3 billion tons of food is wasted every year, which represents around one third of all food generated for human consumption in the world (FAO 2011) (Figure 1).

Figure 1: Types of Wastage in Food Grains



Source: FAO (2011)

This is causing major economic losses to the tune of $750 billion while also wreaking significant havoc on natural resources, according to a new report from the Food and Agriculture Organization (FAO) of the United Nations (Food waste 2013). The exact figures for economic loss related to fungal spoilage are difficult to obtain, however, even given a dry climate and advanced technology, losses of food to fungal spoilage are estimated at $10 million per annum in Australia. Losses in humid tropical climates and countries with less highly developed technology remain staggering (Pitt and Hocking

2009). Conservative estimates put post-harvest losses due to insect infestation, microbiological contamination, and physiological changes in food and agricultural commodities in India between 20–50 percent, which are worth thousands of crores of rupees. As per the report of Swaminathan (Planning Commission 1981), India wastes more fruits and vegetables (up to 40 percent) than are consumed in a country like U.K. In India, even as one fifth of the population is underfed, the total wastage in all food sectors is high and worth Rs. 500,000 million per year; wastage cost of fruits and vegetables is Rs. 350,000 millions of which 5-10 percent is lost on account of insect infestation and inadequate storage (Indian Food Industry 2003).

Chemical deterioration and microbial spoilage are responsible for loss of 25 percent of gross primary agricultural and fishery products every year (Nguyen-the and Carlin 2000). Fresh produce and fluid milk undergoes 20 percent of loss, whereas grains 15.2 percent, fruits and vegetables around 30–40 percent, meat, poultry and fish 8.5 percent (Doyle 2005).

The geographical area of Goa, a tiny state on the West coast of India is 3,70,200 hectares, of which 35 percent was classified as agricultural land in 2010. As per the Developing Initiatives for Social and Human Actions (DISHA) report edited by Sharma et al (cited in TERI 2015) about 37,623 hectares of land was irrigated in comparison to 1,31,587 hectares of net sown area, in 2009–2010. Cultivated area has declined from 2,10,771 hectares in 2006–2007 to 1,49,260 hectares in 2011-2012. Due to the decline in agriculture, Goa imports fruits and vegetables from the adjoining states of Maharashtra and Karnataka. Spoilage of fresh fruits and vegetables usually occurs due to the growth of micro organisms during storage or due to mechanical damage during transportation.

Fungi are naturally present and can contaminate food crops under favourable conditions of temperature, relative humidity, pH, nutrient availability, and oxygen. Fungal food spoilage thus plays a pivotal role in the deterioration of food and feed systems and some of them are also able to produce mycotoxins that can cause

serious health hazards for humans and animals. The toxins may be carcinogenic, immunotoxic, teratogenic, neurotoxic, nephrotoxic and hepatotoxic, or cause Kashin-Beck disease (Frisvad and Thrane 1995).

Nowadays, food spoilage can be prevented using physical and chemical methods, but no efficient strategy has been proposed so far to reduce microbial growth. The overriding factor determining spoilage of fresh, living food is the ability of specific microorganisms to overcome the powerful defence mechanisms present naturally in foods (Pitt and Hocking 2009). Fungi especially yeasts in the presence of sugars, organic acids, and other easily metabolizable carbon sources produce metabolic end products (Kurtzman 2006) that causes the physical, chemical and biological properties of food to change (Fleet and Praphailong 2001). As a major contributor, therefore food spoilage, especially by fungi, represents an environmental problem as well as an ethical issue. In the face of limited resources and the ever increasing population, food security through preservation is becoming increasingly important. Feeding people around the world and keeping them healthy, therefore, is a major challenge. Therefore, this study on spoilage of food by fungi and simple natural methods for its prevention is of extreme significance.

Materials and Methods

2.1 Isolation and characterization of food spoilage fungi

For the present study different types of seasonal fruits (banana, sweetlime, pomegranate, orange, lemon and strawberry); vegetables (tomato, onion and beans); fermented foods (bread and cheese); preserved foods (jam and pickles); cooked cereal foods (rice and chapati); pulses (lentils) and nuts (almonds and peanuts) were purchased from Vasco, Margao, Ponda, Mapusa and Panaji markets of Goa.

The food samples were incubated under various environmental test conditions such as at room temperature (28°C) and refrigeration temperature (4°C); exposed to air (aerobic); in an air tight sterile

cling wrap unexposed to air (anaerobic conditions); exposed to light, and in the dark. The fungal growth on the food samples was observed daily. Optical evaluation of the species was based on the colour and surface characteristics of the cultures and microscopic morphological criteria like size, colour and shape of reproductive and vegetative organs, spores and hyphae (De Hoog et al 2000, Pitt and Hocking 1997, Samson and Pitt 1990). Lactophenol cotton blue mount was prepared and observed under low power and high power of compound microscope. A stereomicroscope was used to observe the morphological characteristics and reproductive and vegetative organs of fungus from spoiled foods.

2.2 Determination of the efficacy of neem, turmeric, ginger and garlic as antifungal agents

a. *Preparation of extract*

Five grams each of neem leaves, ginger, garlic and turmeric powder were weighed separately and kept aside. Turmeric powder was assumed to be sterile, but the neem leaves, ginger and garlic were subjected to surface sterilization by immersing in 70 percent ethanol for 60 seconds, followed by two percent sodium hypochlorite for 90 seconds and finally rinsed in sterile distilled water thrice. 10 ml of methanol was then added to each of the four test substances. They were crushed using a sterile mortar and pestle and the extract was filtered through Whatman filter paper No. 1 and kept in sterile labelled vials for use

b. *Antifungal screening*

Sabouraud's agar was sterilised, cooled to 40°C and 20 ml was poured into each sterile petriplate. Plates were allowed to solidify. A suspension of test fungal cultures was prepared in saline and 0.1ml of suspension was spread plated on the pre-labelled plates. Four wells per plate were bored with the help of sterile cork borers in the Sabouraud's agar. The extracts of neem, turmeric, ginger and garlic were individually loaded in separately pre-labelled wells, using a sterile Pasteur pipette under aseptic conditions. The

plates were refrigerated for 30 minutes for pre-diffusion. After 30 minutes the plates were removed and kept for incubation at room temperature for 24-48 hours. The zone of no fungal growth if any was measured in mm for each of the test fungi i.e. *Aspergillus, Penicillium, Mucor and Rhizopus,* respectively.

Results

A total of 18 human food samples were examined for incidence of fungal contamination by conventional methods (Table 1). The investigation revealed the predominance of *Aspergillus* and/or *Penicillium* in 67 percent of samples contaminated with at least one species of these fungi. The incidence of co-contamination of samples with multiple species of fungi was 80 percent. The second species appeared within two days of the appearance of visible infection by the primary species.

Aspergillus was the most predominant genera contaminating 85 percent fruits, while, *Mucor* and *Penicillium* were the most common co-contaminants. On the other hand, *Botrytis* registered a low incidence rate of 33 percent and was seen only to cause spoilage in bananas. *Botrytis* grew at room temperature in the light as well as dark, under aerobic conditions. Under anaerobic spoilage was *Rhizopus.*

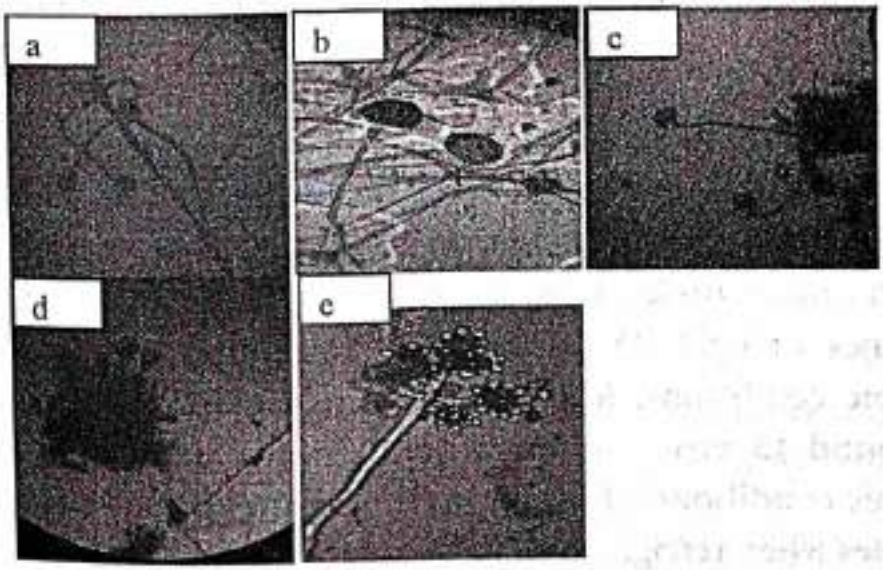
Table 1: Fungal Spoilage of various Food Samples

Samples	Botrytis	Rhizopus	Aspergillus	Mucor	Penicillium
FRUITS					
Banana	+	+	-	-	-
Sweet lime	-	-	+	+	-
Pomegranate	-	-	+	+	-
Orange	-	-	+	+	+
Lemon	-	-	+	-	+
Strawberry	+	-	+	-	-
VEGETABLES					
Tomato	+	+	-	-	+

continued...

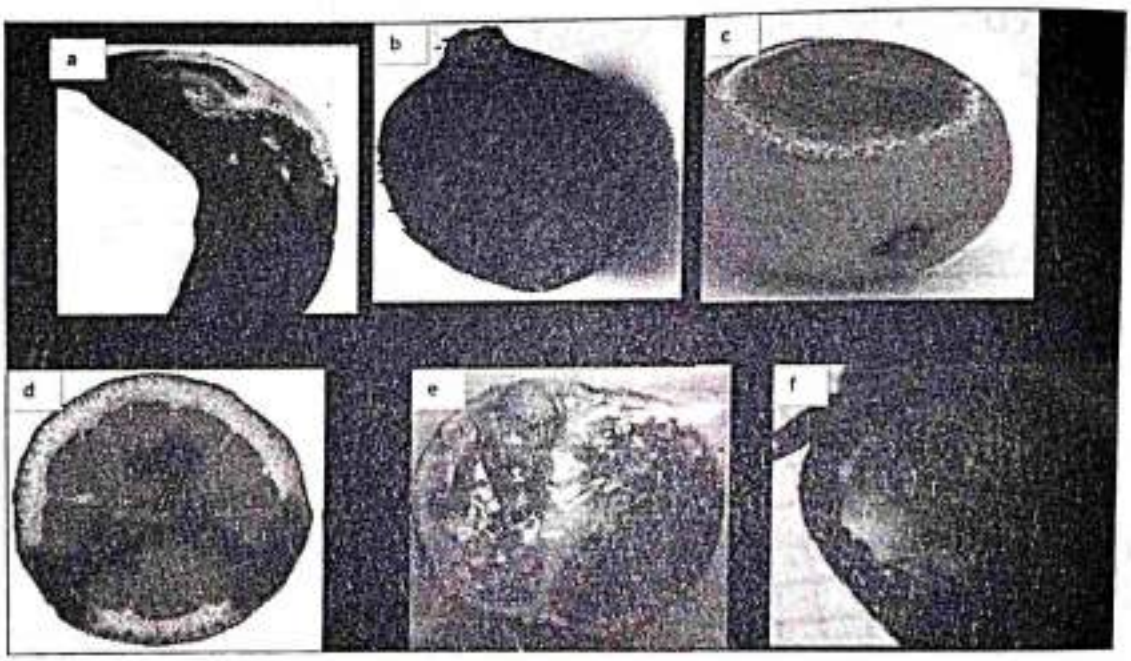
Samples	Botrytis	Rhizopus	Aspergillus	Mucor	Penicillium
Onion	-	-	+	-	-
Beans	+	+	-	-	+
FERMENTED FOODS					
Bread	-	-	+	-	-
Cheese	-	+	-	+	+
PRESERVED FOODS					
Pickle	-	-	-	+	+
Jam	-	-	-	+	+
CEREALS/ COOKED FOODS					
Rice	-	-	+	-	-
Chapati	-	+	+	-	-
PULSES					
Lentils	-	+	+	-	+
NUTS					
Almond	-	-	+	-	-
Peanuts	-	-	+	-	+

Figure 2: (a) Mucor, (b) Rhizopus, (c) Aspergillus, (d) Penicillium, (e) Botrytis



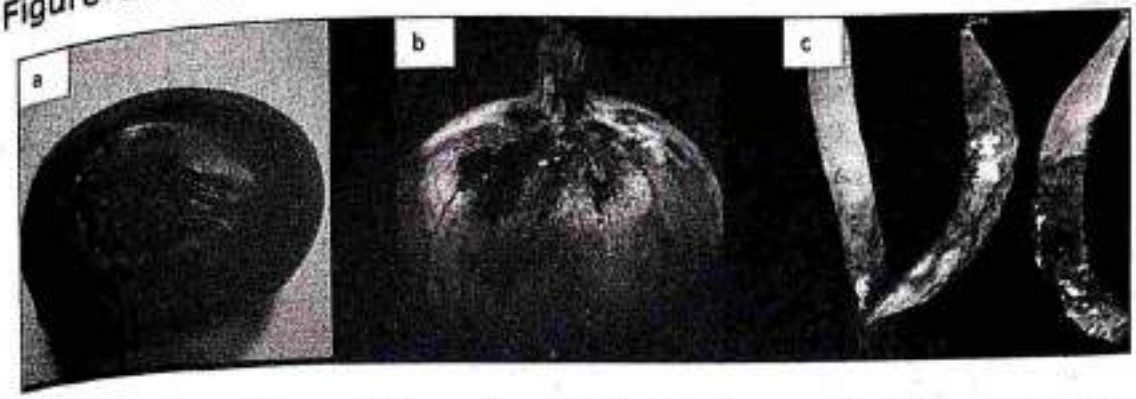
The various genera of fungi commonly causing food spoilage are shown in Figure 2. Fungi were found to attack fruits within three days (Figure 3). *Aspergillus* was found to grow on all fruits both under aerobic as well as anaerobic conditions, but was more likely to grow under anaerobic conditions. *Mucor* loves to grow in dark places which are mostly anaerobic. *Penicillium* was found to grow under aerobic conditions irrespective of the presence or absence of light. Members of the genera *Alternaria* were also registered in the study as late colonizers. The majority of fungal strains isolated i.e. *Aspergillus ochraceus, Aspergillus parasiticus* and *Penicillium crustosum*.

Figure 3: Fungal Spoilage of Fruits



In the case of vegetables (Figure 4), the fungi responsible for spoilage of tomatoes under aerobic conditions were *Botrytis* and *Penicillium*; and under anaerobic conditions it was *Rhizopus*. *Aspergillus* was the most common fungus that was found to grow on onions under aerobic conditions, in the presence as well as absence of light. Decomposition was found to set in under anaerobic conditions. *Rhizopus, Botrytis cinerea* and *Penicillium* were found to grow on beans, both under aerobic as well as anaerobic conditions. However no fungal growth was observed on vegetables when refrigerated.

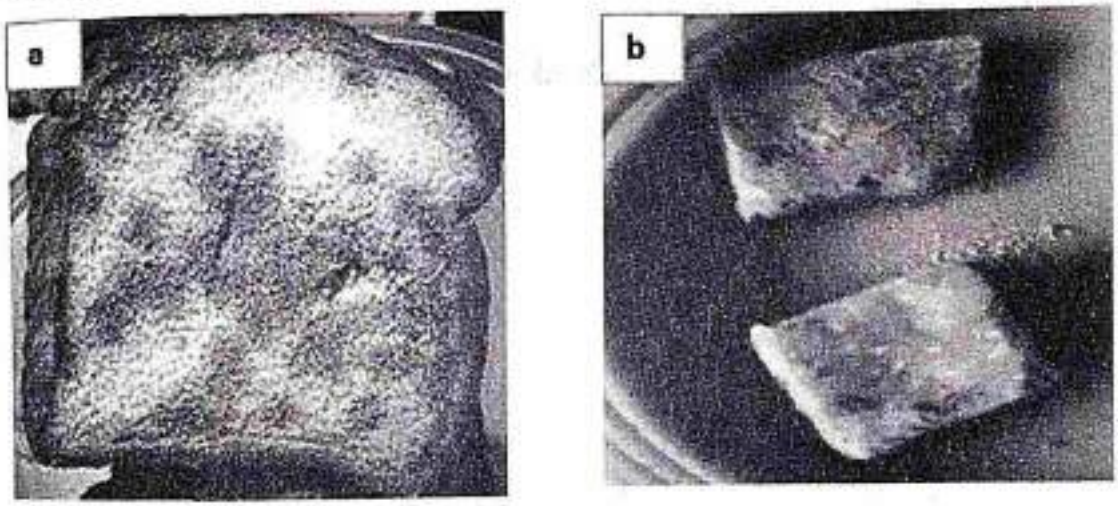
Figure 4: Fungal Spoilage of Vegetables



Fungal spoilage of bread and cheese is seen in Figure 5. The principal fungus that was found harboured on bread under aerobic as well as anaerobic conditions was Aspergillus. However, no fungal growth was observed when bread was refrigerated.

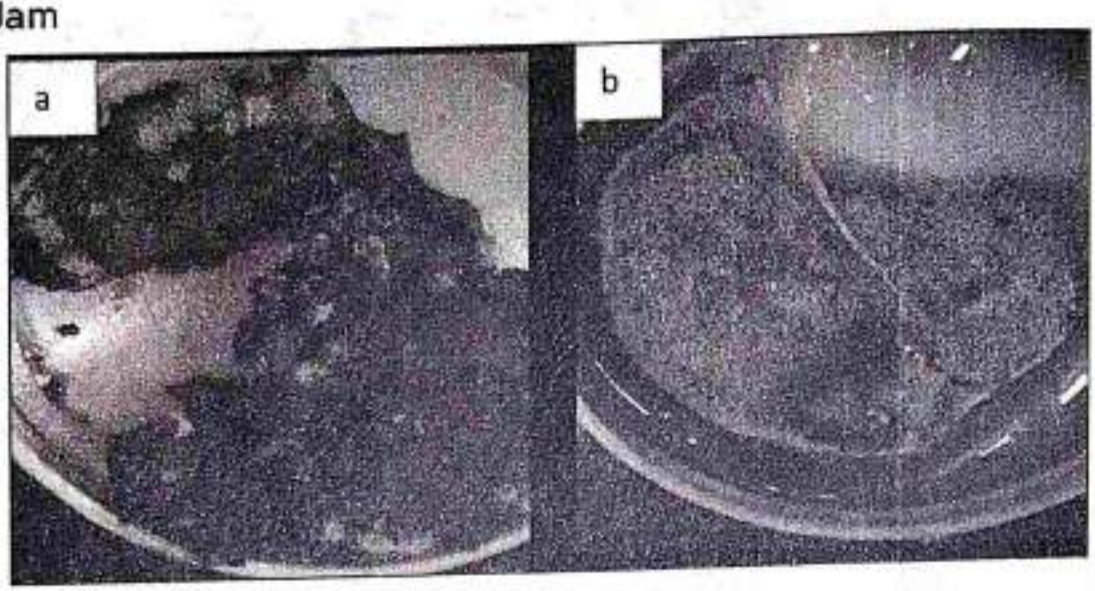
On cheese, *Rhizopus* and *Mucor* were found to grow under aerobic conditions, whereas under anaerobic conditions *Penicillium* was isolated from cheese.

Figure 5: Fungal Spoilage of Fermented Foods - (a) Bread (b) Cheese



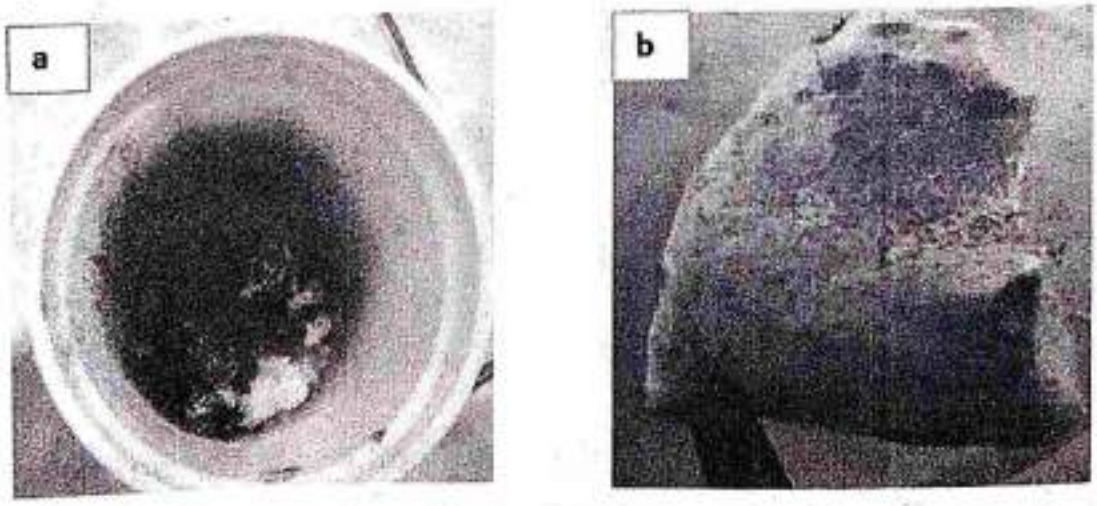
The predominant fungus that was found to grow on pickles under aerobic conditions in the dark was *Mucor*. Under anaerobic conditions *Penicillium* was the principal spoilage organism. However, refrigerated pickles did not show fungal growth. Jam when kept under normal aerobic conditions was found to be attacked by *Mucor*, and if the conditions are anaerobic by *Penicillium* (Figure 6).

Figure 6: Fungal Spoilage of Preserved Foods - (a) Pickles (b) Jam



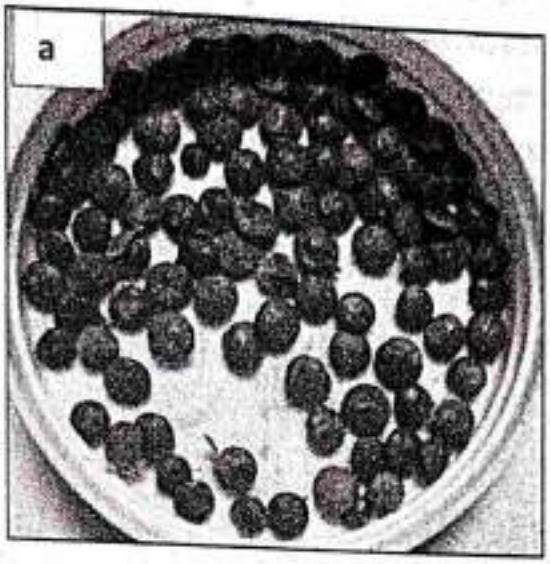
The leading cause of fungal spoilage of rice and chapatti (Figure 7), incubated under aerobic and anaerobic conditions in the dark was *Aspergillus*; whereas *Rhizopus* was responsible for spoilage of chapati incubated under aerobic conditions, in light. No fungal growth was observed on rice or chapati incubated under refrigeration conditions.

Figure 7: Fungal Spoilage of Cooked Cereals: (a) Rice (b) Chapati



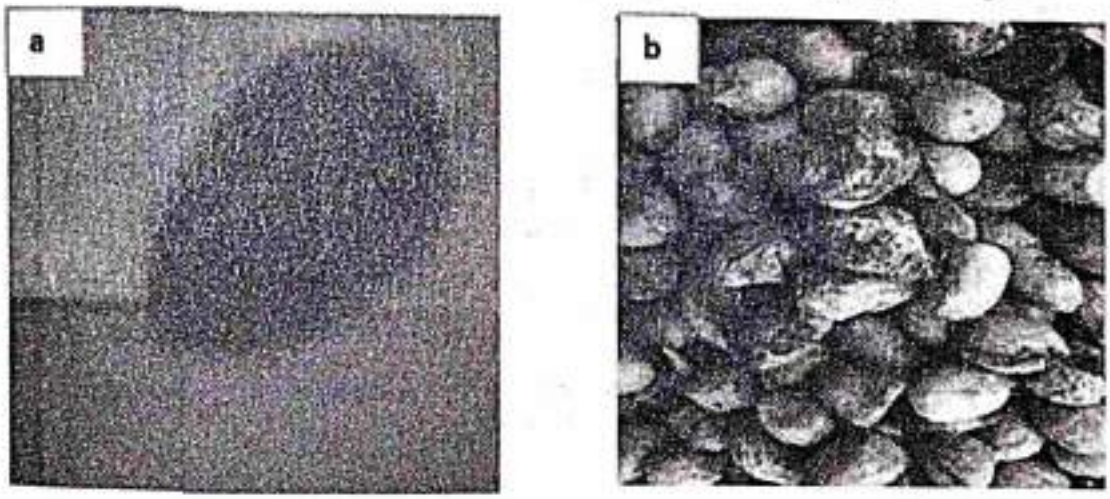
Under aerobic conditions, the spoilage of pulses (Figure 8) was due to *Aspergillus* and *Penicillium*; whereas under anaerobic conditions *Rhizopus* was the causative agent.

Figure 8: Fungal Spoilage of Lentils



Aspergillus and *Penicillium* were predominantly observed on almonds and peanuts (Figure 9) under aerobic as well as anaerobic conditions. However, no growth was seen when stored in the refrigerator.

Figure 9: Fungal Spoilage of Nuts - (a) Almonds, (b) Peanuts



Antifungal activity of ginger, garlic, turmeric and neem are shown in Figures 10 and 11. Garlic extract showed maximum antifungal action against *Penicillium* with a zone of inhibition of 41 mm, followed by *Rhizopus* with 29 mm. In case of *Aspergillus* the zone of inhibition was found to be 25 mm, and for *Mucor* it was 18 mm. Ginger extract was found to be the second most effective antifungal agent, capable of inhibiting *Aspergillus*, *Penicillium*

and *Rhizopus*. Ginger showed a zone of inhibition of 5 mm for *Aspergillus*, 22 mm for *Penicillium* and 15 mm for *Rhizopus*. Neem was effective only against *Mucor*, showing a zone of inhibition of 16mm. Turmeric and Neem have limited use as antifungal agents.

Figure 10: Antifungal activity of Ginger, Garlic, Turmeric and Neem on (a) Aspergillus, (b) Mucor, (c) Penicillium and (d) Rhizopus

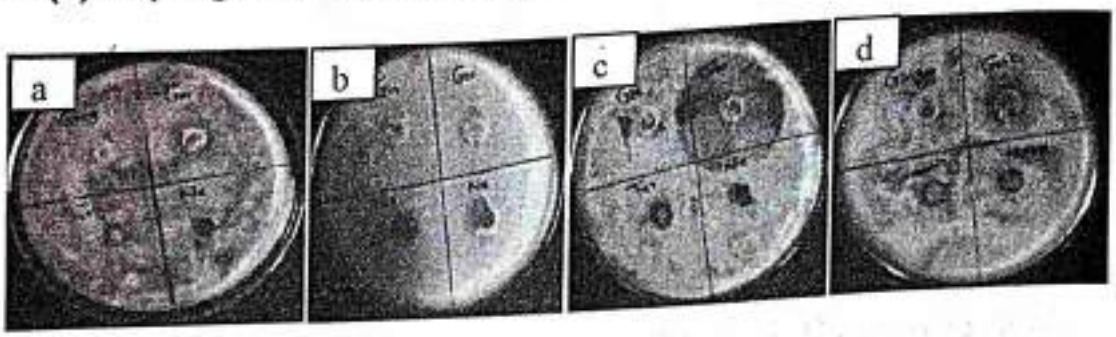
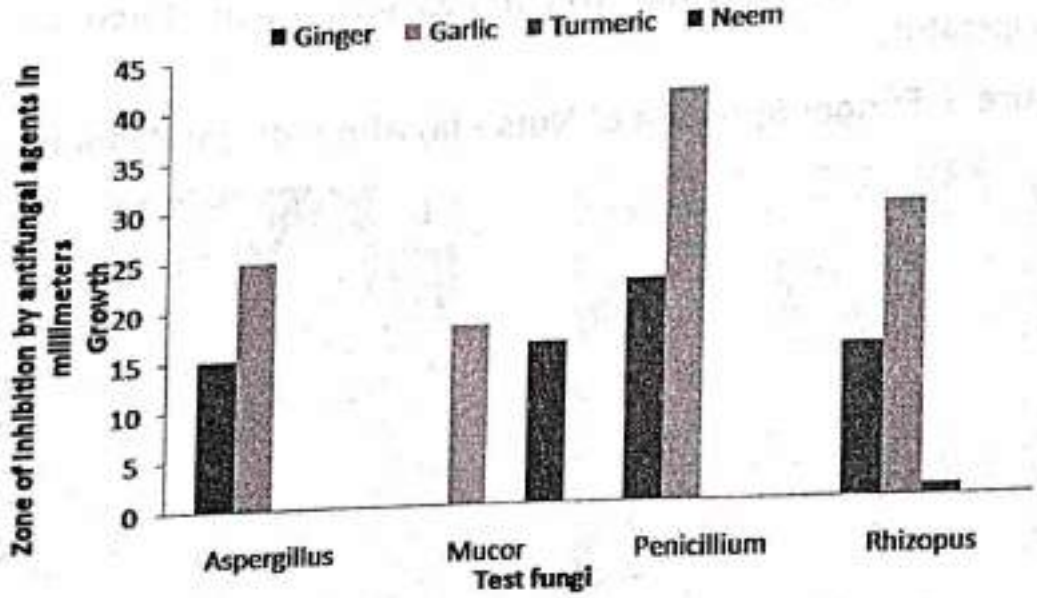


Figure 11: Inhibition of Test Fungi by Antifungal Agents



Discussion

Fungi are the major causitive agents of food deterioration and spoilage, worldwide, ranking second to insects (Jarvis et al 1983). Fungi are capable of growth over a broad range of temperatures. They are obligate aerobes with oxidative metabolism. Particular genera are also capable of growth across a range of water activity from 0.62 to nearly 1. Therefore, they are the most common food spoilage microorganisms at every step of the food chain from the

field (crops) to consumer food products. Besides physical damage, browning and staling, moulds and yeast cause significant food wastage. Frisvad et al (2006) have described the importance of accurate identification of spoilage fungi.

In the present study it was found that *Aspergillus* and *Penicillium* were the dominant spoilage fungi. Once harvested, the fruits ripen quickly and have a very short shelf life (Olorunda and Aworh 1994). As per literature available, *Aspergillus niger* (black mouldy spot) hydrolyses the sugar in the banana fruits and initiates fungal growth (Hansen et al 2003). Our study showed that refrigeration temperature (4°C±1) appeared to be the most suitable for prolonging the life span of banana except that it turns black and unappealing. Sweet limes were found to spoil within 4-5 days due to the growth of *Aspergillus* and *Mucor*, while oranges and lemons spoiled within 5-14 days. In citrus fruits like sweet lime, oranges and lemons, the fungi *Penicillium italicum* and *P. digitatum* (blue and green rot of citrus respectively) caused the most serious and widespread rots of these crops. Grey mould (*Botrytis cinerea*) is known to cause harvested pomegranates to decay at a faster rate than normal. Alternaria fruit rot (*Alternaria alternata*) and *Aspergillus* fruit rot (*Aspergillus niger*) have been reported from inside the fruits causing them to become stunted and discoloured. Moulds can often produce a vast number of enzymes: lipases, proteases, cellulases (Bigelis 1992). Enzymatic action on the fruits may completely disintegrate the food structure, like the change of whole pasteurised strawberries into strawberry pulp due to growth of heat resistant fungi *Byssochlamys fulva* and *Byssochlamys nivea* (Beuchat and Rice 1979).

Other opportunistic fungi reported on most fruits are *Alternaria alternata, Aspergillus niger, Fusarium spp., Geotrichum candidum,* and *Trichoderma viride* (Snowdon 1990, cited in Kempken 2013). Prusky et al (2004) reported *Penicillium expansum* as a post-harvest problem. Borner (1963) implicated high fungal spore densities in the air, caused by growth of the mould in high concentrations on rotten organic materials in orchards as the cause for post harvest disease of fruits.

The average shelf life of fresh-cut vegetables is typically 10–14 days (Cantwell and Suslow 2002). Under refrigerated conditions fruits can be stored up to 1–2 months (cited in Kempken 2013). Normal shelf life of tomatoes is 10–12 days. Onions spoil when they come in contact with rain water. This shows that moisture is the main cause of spoilage in onions. *Alternaria* spores germinate on onion leaves and produce a small, water-soaked spot that turns brown. *Alternaria* gives a black sooty appearance to onions. Other kinds of rots that are seen on onion are pink rot and white mould.

Vegetables, cereals, lentils, and preserved foods are also affected by mould spoilage (Sathe et al 2007). The most commonly isolated yeast and fungi from these foods belong to the following genera - *Aspergillus, Penicillium, Rhizopus, Mucor, Botrytis, Alternaria, Candida, Cladosporium, Colletotrichum, Fusarium, Phoma, Phomosis, Phytophtora, Pythium, Rhizoctonia, Rhodotorula, Sclerotinia,* and *Zygosaccharomyces* (Tournas 2005; Tournas et al 2006).

Aspergillus is a very common mould found on bread and preserved fruit. In the conidial stage it is green and in the ascosporic stage yellow, reddish yellow, or reddish brown. *Aspergillus* is almost sure to appear on bread which is kept moderately moist, because the conidia are usually abundant in the atmosphere. Spoilage of cheese occurs due to *Penicillium* and *Aspergillus* (Aran and Eke 1987).

Filamentous lipolytic fungi like *Aspergillus, Penicillium, Alternaria, Rhizopus* and *Mucor* isolated from pickles are able to produce lipolytic enzymes, responsible for the spoilage and rancidity of oily pickles. Pickle softening is known to be caused by pectinolytic organisms of the genera *Fusarium, Penicillium, Cladosporium, Alternaria, Mucor, Aspergillus, Rhodutorula* etc. *Aspergillus* forms coloured colonies along with Saccharomyces on jams. Masih et al (2000) reported *Penicillium* from jams.

Much research work on the spoilage of cooked rice and its prevention has been done. Moulds cause spoilage by altering the appearance of grains and flours, and some species also synthesize toxic secondary metabolites called mycotoxins (Riveros 2000).

Spoilage in cooked food is attributed to its water content.

Pulses being dry when exposed to slight moisture, initiate the growth of moulds. Fungi that grow on pulses are *Fusarium, Botrytis, Phoma, Sclerotinia* etc. Saprophytic fungi isolated from most lentil seeds belong to the species of *Aspergillus* and *Cladosporium*. Lentils are known to be affected by rains.

Almonds are known to be subject to Brown rot caused by *Monilinia laxa* or *Monilinia fructicola*, Green Fruit Rot or Jacket Rot caused by *Monilinia spp.* or *Botrytis cinerea* or *Sclerotinia sclerotiorum* (Bostock et al 1999). It is said that spoilt peanuts could contain a mycotoxin-producing fungus called *Aspergillus flavus*.

Production of mycotoxins by fungi is a remarkable problem, endangering human health. In particular, species belonging to the genera of *Aspergillus, Fusarium* and *Penicillium* have been associated with the production of aflatoxins, fumonisins, ochratoxins, patulin, trichothecenes, and zearalenone (Bhat et al 2010). Mycotoxins from fungi can cause acute and chronic illnesses, induce cancer, and damage vital organs such as the liver, kidney and brain. A variety of fungi produce illness with symptoms such as vomiting, diarrhea, headaches, chills, dizziness, and blurred vision. The presence of mycotoxins in foods is therefore potentially dangerous for humans and animals and thus constitutes a serious problem (Dalie et al 2010).

With respect to food spoilage, *Aspergillus* seems to be more abundant in tropical areas than *Penicillium*, which is observed more in temperate areas. *Aspergillus, Penicillium, Alternaria* and *Fusarium* are amongst the most common mycotoxin-producing fungal species associated with growth and damage to food crops in the field and in stores, if poor storage conditions prevail after harvest, or previously dried commodities become rewetted (Pitt 1991). Opportunistic fungi cause infections of fruit and vegetables by entering through cracks, wounds or natural orifices on the surface of crops and result in post-harvest diseases. Therefore, careful handling of crops directly after harvesting is vital for the quality of the product. The rate of deterioration or spoilage fresh or processed food is influenced by the environment to which it is

exposed (Rais and Sheoran 2015). The exposure of food to oxygen, light, warmth or even small amounts of moisture can often trigger a series of damaging chemical and/or microbial reactions. Fungi develop inside buildings (where storage occurs), and their proliferation is often related to leakage, flooding, condensation, and humidity. Changing the environment can help to delay spoilage. Knowledge of these parameters will lead to the development of novel tailor-made preservation strategies.

Fungal inhibitors such as propionic, acetic, lactic, benzoic, and sorbic acids alter the pH equilibrium of microorganisms cause the inhibition of microbial growth (Wagner and Moberg 1989). Biocontrol agents such as the yeast *Pichia anomala* counteract growth of spoilage fungi in case of high-moisture feed grain under airtight conditions (Petersson et al 1999). Herbs have been used in foods since ancient times, not only as folk medicine, but also as flavoring agents and food preservatives. (Beuchat 1994; Cutler 1995, as cited in Mohanka and Priyanka 2014; Evans 1995) due to their antimicrobial activity against certain pathogens (Ahmad and Beg 2001; Erasto et al 2004; Fukai et al 2002; Puupponen et al 2001; Rauha et al 2000; Salie et al 1996; Tepe et al 2004; Xu et al 1998) and a wide array of medicinal properties (Wood et al 2001).

In our study antifungal activity of some natural compounds such as ginger, garlic, turmeric and neem was studied. Among the tested compounds, garlic showed the best inhibitory activity, followed by ginger. Garlic is known to contain the substance Allicin that can inhibit growth of all fungi (Reuter et al 1996), followed by ginger that contains the compound caprylic acid, which has potent antifungal properties and is popularly used to treat conditions like indigestion, nausea, vomiting, sore throats, the common cold, headache, fevers, flu symptoms, rheumatism, and motion sickness (Ernst and Pittler 2000). There are classified compounds within neem that have antifungal properties such as nimbin and nimbidin. Further research on the development of new, natural anti-fungal compounds requires to be done for the development of safe and novel bio-preservation tools.

Conclusion

Research on fungi that cause spoilage of food and the mycotoxins they produce can only be carried out effectively based on accurate identification of the microorganisms responsible. Nowadays, with consumers tending to demand more "naturally preserved" or preservative-free products, chemical antifungals are becoming less attractive as food preservatives. The indiscriminate use of synthetic antifungals has led to the development of resistant strains which has necessitated utilization of higher concentrations, with the consequent increase in toxic residues in food products. The metabolites produced by plants thus present a promising alternative. Numerous studies have demonstrated that plant extracts contain diverse bioactive components that can control mould growth. Garlic which showed promising results as a "natural antifungal agent" needs to be investigated further. If food spoilage is to be prevented with a view to increase production and storage, advancement of our scientific knowledge of the spoilage organisms is of utmost importance.

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REFERENCES

Ahmad, I. and Beg A.Z. (2001). Antimicrobial and phytochemical studies on 45 Indian medicinal plants against multi-drug resistant human pathogens. *J. Ethnopharmacol.* 74: 113–123.

Aran, N. and Eke D. (1987). Mold mycoflora of Kasar cheese at the stage of consumption. *Food Microbiology.* 4: 101–104.

Beuchat, L.R. (1994). Antimicrobial properties of spices and their essential oils. In Dillon, Y.M. and Board, R.G. (Eds.), *Natural Antimicrobial Systems and Food Preservation*, CAB International, Wallingford, U.K., pp167–179.

Beuchat, L.R. and Rice S.L. (1979). *Byssochlamys* spp. and their importance in processed fruits. *Adv. Food Res.* 25:237–288.

Bhat, R., Rai R.V., Karim A.A. (2010). Mycotoxins in food and feed: Present status and future concerns. *Comprehensive Reviews in Food Science and Food Safety*, 9: 57–81.

Bigelis, R. (1992). Food enzymes. In D.B. Finkelstein and C. Ball (Eds.), *Biotechnology of Filamentous Fungi: Technology and Products.* Butterworth-Heinemann, Boston, MS, pp. 361–415.

Borner, H. (1963). Untersuchungen uber die Bildung antiphytotischer und antimicrobieller Substanzen durch Mikroorganism im Bodem und ihre mo¨gliche Bedeutung fu¨r die Bodenmu¨digkeit beim Apfels Pirus malus L. *Phytopathol Z* 49:1–28. In Kempken F. (Ed.) *The Mycota - Agricultural applications*, XI edition. Springer, Berlin/Heidelberg.

Bostock, R.M., Wilcox S.M., Wang G. and Adaskaveg J.E. (1999). Suppression of Monilinia fructicola cutinase production by peach fruit surface phenolic acids. *Physiol. Mol. Plant Pathol.* 54: 37–50.

Cantwell, M.I. and Suslow T.V. (2002). Postharvest handling systems: Fresh-cut fruits and vegetables. In A. A. Kader (Ed.), *Post Harvest Technology of Horticultural Crops.* University of California, Davis. pp. 445–463.

Cutler, H.G. (1995). Natural product flavor compounds as potential antimicrobials, insecticides and medicinal: Agro. food ind. *Hi-Tech.* 6:19–23.

Dalié, K.D.K., Deschamps A.M. and Richard-Forget F. (2010).

Lactic acid bacteria – Potential for control of mould growth and mycotoxins: A review. *Food Control.* 21(4): 370–380.

De Hoog, G.S., Guarro J., Gené J. and Figueras M.J. (2000). *Atlas of clinical fungi.* 2nd ed. – Utrecht: Centraal bureau voor Schimmelcultures/ Universitat Rovira and Virgili, Reus, Spain.

Doyle, M.E. (2005). Microbial food spoilage: Losses and control strategies. *A brief review of the literature.* Retrieved from: http:// fri_ wise edu/ docs/ pdf/ FRI_Brief_ microbial_ food_ spoilage 7_07 pdf

Erasto, P., Bojase-Moleta G. and Majinda R.R.T. (2004). Antimicrobial and antioxidant flavonoids from the root wood of Bolusanthus speciousus. *Phytochermistry.* 65: 875–880.

Ernst, E. and Pittler M.H. (2000). Efficacy of ginger for nausea and vomiting: a systematic review of randomized clinical trials. *British Journal of Anaesthesia.* 84(3): 367–371.

Evans, C.S. (1995). Spices, herbs and edible fungi. Edited by G. Charalambous, Elsevier Science Ltd., Amsterdam, 1994, xv + 764 pp. *J. Chem. Technol. Biotechnol.* 63: 393–394.

FAO (2011). Global food losses and food waste – Extent, causes and prevention. Rome. Retrieved from: http://www.fao.org/ docrep/014/mb060e/mb060e00.htm

Fleet, G.H. and Praphailong W. (2001). Yeasts. In Moir C.J.(Ed.) *Spoilage of Processed Foods: Causes and Diagnosis.* Food Microbiology Group of the Australian Institute of Food Science and Technology (AIFST). pp 383–397.

Food waste (2013). Retrieved from: http://www.fao.org/news/story/ en/item/196220/icode/

Frisvad, J.C. and U. Thrane (1995). Mycotoxin production by food-borne fungi. In R.A. Samson, E.S. Hockstra, J.C. Frisvad and O. Filtenborg (Eds.), *Introduction to Food-Borne Fungi*, 4th Ed. Central bureau voor Schimmel cultures, Barn. pp. 251–260.

Frisvad, J.C., Nielsen K.F. and Samson R.A. (2006). Recommend-ations concerning the chronic problem of misidentification of mycotoxigenic fungi associated with foods and feeds. In A.D. Hocking, J.I. Pitt, R.A. Samson and U. Thrane (Eds.) Advances in Food Mycology – *Advances in Experimental Medicine and Biology.* Vol. 571: 33–46. Berlin: Springer-Verlag.

Fukai, T., Marumo A., Kaitou K., Kanda T., Terada S. and Nomura T. (2002). Antimicrobial activity of licorice flavonoids against methicillin resistant *Staphylococcus aureus. Fitoterapia*, 73: 536–539.

Hansen, L.E., Panella L., Hill H.L. and Preston G.M. (2003). Screening Biological control agents for *Rhizoctonia solani* control in sugar beets. *Proteomics*.11: 1–5.

Indian Food Industry (2003). Indian food industry: Will the sun ever rise? In V.H. Potty (Ed.), *Diversified Food Technologies (India)*. Vol 22(2).

Jarvis, J.B., Seiler D.A.L., Ould A. and Williams A.P. (1983). Observation on the enumeration of moulds in foods and feeding stuff. *J. Applied Bacteriol*, 55: 325–336.

Kempken, F. (Ed.) (2013). *The Mycota; Agricultural Applications* [XI edition]. Berlin/Heidelberg: Springer.

Kurtzman, C.P. (2006). Detection, identification, and enumeration methods for spoilage yeasts, p. 28–54. In Blackburn C. (Ed.), *Food Spoilage Microorganisms*. Boca Raton FL: CRC Press LLC.

Masih, E.I., Alie I. and Paul B. (2000). Can the grey mould disease of the grape-vine be controlled by yeast? *FEMS Microbiology Letters*, 189(2): 233–237.

Mohanka, R. and Priyanka (2014). Plant extract as natural food preservative against spoilage fungi from processed food. *Int.J.Curr.Microbiol.App.Sci*: 3(8): 91–98.

Nguyen-The, C. and Carlin F. (2000). Fresh and processed vegetables. In B.M. Lund, T.C. Baird-Parker and G.W. Gould (Eds.) *The Microbiological Safety and Quality of Food*, Vol. 1: 620–684. Gaithersburg, Maryland: Aspen Publishers, Inc.

Olorunda, A.O. and Aworh O.C. (1994). Effects of tal-prolong, a surface coating agent on the shelf life and quality attributes of plantain. *Journal of Food Science and Agriculture*. 35: 573–578.

Petersson, S., Jonsson N., Schnu¨rer J. (1999). Pichia anomala as a biocontrol agent during storage of high moisture feed grain under airtight conditions. *Postharvest Biol Technol*. 15: 175–184.

Pitt, J.I. (1991) Toxigenic *Aspergillus* and *Fusarium* species. In Semple R.L., Frio A.S., Hicks P.A., Lozare J.V. (Eds.) *Mycotoxin Prevention and Control in Food Grain*. Regnet/AGPP, 25–32.

Pitt, J.I. and Hocking A.D. (1997). *Fungi and food spoilage.* New York: Blackie Academic and Professional.

Pitt, J.I. and Hocking A.D. (2009). *Fungi and food spoilage.* DOI 10.1007/978-0-387-92207-2_2

Pitt, J.I. and Hocking A.D. (Eds.) (2012). The ecology of spoilage fungi. In Fungi and Food Spoilage. *Springer Science & Business Media, Technology & Engineering,* 2:1–593.

Planning Commission (1981). Retrieved from: nic.in/reports/publications/ar_e81_82.pdf

Prusky, D., McEvoy J.L., Saftner R., Conway W.S. and Jones R. (2004). Relationship between host acidification and virulence of *Penicillium* spp. on apple and citrus fruit. *Phytopathol.* 94:44–51.

Puupponen, P.R., Nohynek L., Meier C., Kahkonen M.M., Heinonen A. and Hopia K.M. (2001). Antimicrobial properties of phenolic compounds from Berries. *J. Applied Microbiol.* 90: 494–507.

Rais, M. and Sheoran A. (2015). Scope of supply chain management in fruits and vegetables in India. *J. Food Process Technol.* 6: 427. doi:10.4172/2157-7110.1000427

Rauha, J.P., Remes S., Heinonen M., Hopia A., Kahkonen M., Kujala T., Pihlaja K., Vuorela H. and Vuorela P. (2000). Antimicrobial effects of Finnish plant extracts containing flavonoids and other phenolic compounds. *Int. J. Food Microbiol.* 56: 3–12.

Reuter, H.D., Koch H.P. and Lawson D.L. (1996). Therapeutic effects and applications of garlic and its preparations. In Koch H.P and Lawson D. L. (Eds.) *Garlic: The Science and Therapeutic applications of Allium sativum L. and related species,* 2nd Ed. pp.135–212. Baltimore: Williams and Wilkins.

Riveros, F. (2000). Key note address of the 18th session of IRC. In JS Nanda (Ed.) *Rice breeding and Genetics Research priorities and challenges.* Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi. pp 349–369.

Salie, F., Eagles P.F.K. and Leng H.M.J. (1996). Preliminary antimicrobial screening of four South African asteraceae species. *J. Ethanopharmacol.* 52: 27–33.

Samson, R.A. and Pitt J.I. (Eds.) (1990). Modern concepts in *Penicillium* and *Aspergillus* systematics. New York: Plenum Press.

Sathe, S.J., Nawani N.N., Dhakephalkar P.K. and Kapadnis B.P. (2007). Antifungal lactic acid bacteria with potential to prolong shelf-life of fresh vegetables. *Journal of Applied Microbiology.* 103: 2622–2628.

Snowdon, A.L. (1990). A colour atlas of post-harvest diseases and disorders of fruits and vegetables, vol 1, General introduction and fruits. London: Wolfe Scientific Ltd. In Kempkin F (Ed). *The Mycota - Agricultural applications*, XI edition. Springer, Berlin/Heidelberg.

Tepe, B., Daferera D., Sokmen M., Polissiou M. and Sokmen A. (2004). In vitro antimicrobial and antioxidant activity of the essential oils and various extracts of *Thymus eigii* M Zohary et P.H Davis. *J. Agric. Food Chem.* 52(5): 1132–1137. DOI 10.1021/ jf035094l.

TERI (2015). *Directions, innovations, and strategies for harnessing action for sustainable development in Goa.* New Delhi: The Energy and Resources Institute. pp. 274. Available at www. teriin.org.

Tournas, V.H. (2005). Spoilage of vegetable crops by bacteria and fungi and related health hazards. *Crit. Rev. Microbiol.* 31: 33–44.

Tournas, V.H., Heeres J. and Burgess L. (2006). Moulds and yeasts in fruit salads and fruit juices. *Food Microbiol.* 23: 684–688.

Wagner, M.K. and Moberg L.J. (1989). Present and future use of traditional anitimicrobials. *Food Technol.* 43: 143–147.

Wood, C., Wargovich M.J. and Hollis D.M. (2001). Herbals cancer prevention and health. *J. Nutrition.* 131: 3034–3034.

Xu, Y.L., Shan X.Z. and Wang Z.Y. (1998). Chemical constituents from Eupatorium adenophorum. *Acta Bot Yunnan.* 10: 238–240.

A REVIEW OF THE CHALLENGES FACING THE INDIAN AGRICULTURAL SECTOR

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ABSTRACT

India is one of the fastest developing economies of the world; with agriculture being the backbone of the Indian economy. The agriculture sector is the mainstay of the Indian economy, contributing about 15 percent of national Gross Domestic Product; more importantly about half of India's population is wholly or significantly dependent on agriculture and allied activities for their livelihood. Besides providing employment, the sector also helps the economy to generate a significant amount of foreign exchange. This paper makes an attempt to highlight the various challenges which hamper the growth of the Indian agricultural sector; at the same time it tries to make some recommendations for the benefit of the sector.

Keywords: agriculture; climate change; horticulture

Introduction

Agriculture plays a key role in the Indian economy. It not only contributes to the gross domestic product (GDP) of the nation but it also provides employment to a large number of the workforce. Also, the forward and backward linkage effects of agriculture growth increases the incomes in the non-agriculture sector. The growth of commercial crops production has significant potential

for promoting exports of agricultural commodities and bringing about faster development of agro-based industries. Thus agriculture not only contributes to overall growth of the economy but also helps in reducing poverty by providing employment and food security to the majority of the population in the country. However, in spite of its importance, the contribution of the agricultural sector to the GDP has continued to decline over the years, while that of other sectors, particularly services, has increased (Sharma 2011). This could be true because of the various problems faced by the agricultural sector in India.

Objectives

1. To highlight the various challenges which the Indian agricultural sector is facing.
2. To list measures that can be adopted to boost India's agricultural sector.

Challenges Faced by the Indian Agricultural Sector

Sharma (2011) found that the area under food grains declined by about 6 million hectares between TE (Triennium Ending) 1983-84 and TE 2008-09 and this decline in area under food grains reduced the share of food grains in total cropped area from about 73 percent in TE 1983-84 to about 63.8 percent in TE 2007-08. The decline in area under food grains resulted in increase in area under other crops. Due to shift in demand pattern towards high value crops, the farmers are also responding to market signals and gradually shifting production-mix to meet the growing demand for high value commodities. This is reflected in the changing share of high value crops in total value of output from agriculture. There is a clear shift from food grains towards fruits and vegetables, livestock products and fisheries. Although firm statistics on land areas affected by salinity and water logging are lacking, according to the CSSRI report of 2011, nearly 6.73 million hectares of agricultural land is affected by varying degrees of salt problems and represents a serious threat to food production to meet the needs of the country (cited in ibid).

As was expected, the growth in food grains production deteriorated when India entered the era of globalization. The free market play adversely affected the production of food grains and the rate of growth of food grains production declined after the introduction of New Economic Policy (NEP) in India. From 1970–71 to the end of the 1990s, the production of food grain grew by 2.80 percent annually where as the growth rate of food grains for the period of 1991–92 to 2008–09 was 1.98 percent, comparatively lesser than the previous period. This might have happened because, before the introduction of new economic policy agricultural inputs were highly subsidized and available at lower prices than in the free market. But after 1991, the cost of fertilizers, seeds, irrigation facilities etc. increased – thereby making it difficult for the small farmers to purchase the same, with the consequence being decline in total food grains production (Ahmad and Haseen 2012). It was also found that as the process of industrialization and urbanization accelerated more and more agricultural land was brought under non-agriculture uses (ibid).

According to Parvathi and Arulselvam (2013), India has witnessed high economic growth in the last one decade, but the problem of food and nutrition insecurity still remains a great threat to a large number of poor and vulnerable people in the country. According to the FAO report 2011 (cited in ibid) the stark reality is that India has 29 percent of the 872.9 million undernourished people in the world. World Health Organization reports that 49 percent of the world's stunted children and over 46 percent of world's undernourished children live in India (as in Parvathi and Arulselvam 2013). In a developing country like India, food security means making available minimum quantity of food grains to the entire population. Despite the fact that India has made a satisfactory achievement in food grains production, its population growth has nullified the benefits of production. Thus, examination of food-population relationship is important.

The study conducted by Shinoj and Mathur (2008) has shown that exports of various agricultural commodities from India responded differently in terms of comparative advantage

during the post-reforms period. India has enjoyed a comparative advantage in tea exports but has depicted a declining trend over the years. However, Sri Lanka has shown a far better advantage in comparison to India and other countries like China and Indonesia. A similar pattern has been observed in coffee exports also, where India has been found losing its comparative advantage to other coffee exporters like Vietnam and Indonesia. A gradual decline in India's comparative advantage has been depicted for exports of spices and cashew also. India's comparative advantage in most of the important agricultural exports has been found to be eroding and losing out to other Asian competitors in certain commodities during the period after economic reforms (ibid).

It may be noted that Indian agriculture is the home of small and marginal farmers with the figures standing at about 80 percent (Dev 2012). Therefore, the future of sustainable agriculture growth and food security in India depends on the performance of small and marginal farmers. Agricultural Census data shows that there were about 121 million agricultural holdings in India in 2000–01, with there being around 99 million small and marginal farmers. Average size of holdings has declined from 2.3 ha in 1970–71 to 1.37 ha in 2000–01. Thus, there are significant land inequalities in India.

Farmers' suicides are perhaps the reflection of the breakdown of institutional safety nets, which in the past have cushioned the impact of agrarian crisis (Shiva and Jalees 2012). The profitability rates for farmers have been declining since 1990. At the same time, the State has reduced its intervention, leaving the farmers at the mercy of the free market. In Rajasthan, during the last five years, more than 330 deaths by farmers have been reported. Declining profitability rate is one of the causes of suicides. In almost every case, the reasons for suicide are the same: poor price of the agriculture produce, crop failure and massive indebtedness. A large number of the farmers committed suicides by consuming pesticides.

In the ten year period between 1997 and 2006 as many as 1,66,304 farmers committed suicide in India (Nagaraj 2008). The large number of suicides by farmers in various parts of the country

is perhaps the most distressing phenomenon observed in India over the last decade. These suicides, reached almost epidemic proportions in certain pockets of the country. The trends in both the number of suicides and the rate of suicides are distressing; while the number seems to jump to a higher level in certain years (as in 1998 and 2002), in the subsequent years after these sharp jumps, there is no reverting back to older numbers; they in fact seem to stabilize at this higher level till the next jump occurs. As for the farmers suicide rates, there is reason to believe that they are increasing over time, at least from the year 2001 onwards.

Until the middle of this century, air pollution was primarily a problem of urban and industrial regions in the developed nations. In the last three decades, however, changes in the pattern of air pollutant emissions, including increases in those from motor vehicles, have led to greater pollutant impacts in more remote rural areas (Marshall et al 2003). Air pollution in and around these cities, and in the surrounding countryside, could also have significant impacts on agricultural production.

There are three major ways in which air pollutants may damage agricultural production (see Marshall et al 2003): (i) *direct visible injury*, usually to leaf tissue. If extensive, this can affect crop yield, and superficial damage can make the crop look less appealing to consumers, thus lowering its value; (ii) *direct effects on growth and yield*. Experiments with a range of different pollutants have shown that yields are generally reduced with increasing exposure to pollutants, even in the absence of visible injury; and (iii) *indirect effects*. Even at relatively low levels, air pollutants may cause a range of subtle physiological, chemical or anatomical changes which will not lead to detectable yield reductions under optimal growth conditions. However, these changes may increase the crop's sensitivity to other stresses, thereby contributing to significant yield losses. Exposure to sulphur dioxide and nitrogen dioxide, for example, consistently leads to increased growth rates of a range of aphid pests.

Among the environmental problems of agriculture, water-related problems occupy an important place. Environmental

problems in agriculture have proven difficult to address due to the spatial heterogeneity and temporal variability intrinsic to agriculture (Hosam et al 2010). Agriculture is largely a struggle against nature – both its sustainability and the prospects for improving environmental performance and farm income simultaneously are thus inherently limited. Water serves as a medium for transporting matter both inside and outside the given agro ecosystem. The water-related environmental problems of agriculture are connected with mechanical treatment of soil and use of fertilizers, pesticides, and other chemicals, and are naturally closely related to irrigation.

Wells emerged as a major source of irrigation in India over the past six decades. From a mere 28 percent in 1950, ground water now irrigates nearly 65 percent of the country's net irrigated area (Bassi 2015). An important reason for growth in well irrigation is the policy of supplying heavily subsidised or free electricity to the farm sector. However, this has resulted in its own set of negative externalities, the major implication being ground-water over-exploitation, especially in water scarce but land-rich western regions of the country. Over-exploitation of ground-water in western India has not only led to ground-water scarcity but has also resulted in wasteful use of energy, as farmers are not confronted with the marginal cost of abstracting ground-water. It has been found that most of the benefits to the farm sector in the form of energy subsidy or solar pump adoption are availed by medium and large farmers.

There is a huge rise in land prices across the country. One important consequence of this rise is the increase in absentee land ownership, higher tenancy and increased land rents, which have all complicated class-caste relations. For instance, landowners across the caste groups have exited from practicing agriculture, while non-owners belonging to different castes have become primary producers. On the other hand, landless agricultural workers and tenants have become more vulnerable in a socially regulated economy. This has been found by Prasad (2015) in a study conducted in Andhra Pradesh.

The Way Forward

According to Ghufran and Ashraf (2012) India is a large, low-cost producer of fruits and vegetables, and horticulture is a sector with huge export potential. But, high transportation costs, inadequate storage facilities, fragmented supply chain, and weak quality standards at home are eroding its competitiveness. Rising incomes and growing consumer interest in a variety of fresh fruits and vegetables year-round is stimulating international trade in horticulture. India being a home of wide variety of fruits and vegetables holds a unique position in production figures among other countries and is one of the world's biggest producers of horticultural products growing nearly 11 percent of all the world's vegetables and 15 percent of all fruits, and its production costs are less than half of those in other parts of the world. Despite these advantages, India's share in the global market is insignificant – it accounts for only 1.7 percent of the global trade in vegetables and 0.5 percent in fruits. To exploit the benefits that India has in terms of fruits and vegetables (horticulture) sufficient storage facilities need to be provided, along with the provision of other benefits to farmers in the form of transport cost.

Ahmad et al (2013) in a study in Jammu and Kashmir found out that horticulture sector serves as a highly contributing industry to the state's economy. Out of the total area of horticulture in the state, 90 percent was concentrated in the valley due to its suitable climate with annual turnover of 75 million US$; this sector being the biggest source of income in the state's economy next to agriculture. Contribution of horticulture sector to states GDP is 7–8 percent, with 45 percent of economic returns in the agricultural sector being accounted for by horticulture. Due to the continuous increasing trend in the production and export of fresh and dry fruits the agricultural land gets diversified into horticultural land and increasing production of horticultural produce directly influences the income, employment and living standard in the rural areas of state.

Thus considering the growth prospects of this sector, the

government of India needs to plan for higher and more quality production. The government should shift its agriculture development strategy from food security mode to that of value addition by growing certain products like high value fruits, vegetables and cash crops like saffron that can give high returns. The need of the hour is to explore new areas, which could not only meet our domestic needs but also help the farmers to earn significant income and contribute towards the GDP of the nation.

According to the Director, Indian Council of Agricultural Research (ICAR), Goa, Dr. V S Korikanthimath (2009), Goa is one of the States with most favourable climatic conditions, having the considerable potential for value added agricultural development. He however adds that Goan agriculture faces threats due to increased industrialization, increased intrusion of tourism and mining on agricultural land which have relegated the agricultural activities to third position; consequently people engaged in agriculture are declining steadily. This might be true for other states too. According to Korikanthimath, prioritization has to be made for promotion of high value cash crops, horticultural crops, appropriate livestock and fish farming, integrated to suit the local agro-climatic conditions (ibid).

Srivastava and Prakash (2014) found out that India is the second-largest producer of fish in the world (over 9 million tonnes). India was found to have a comparative advantage in marine product exports. At the same time India has a large and varied raw material base for food processing. The Indian food processing industry is primarily export oriented. Agricultural Processed Food Products have considerable export potential and if it is properly utilized, growers, processors, traders as well as the national economy will benefit. It requires correct assessment of world market, high quality of raw produce, high quality of processed product and competitive production cost.

Jayaraman and Murari (2014) found that more frequent occurrence of extreme climate events, such as drought, floods, cyclones, etc. are expected to be a feature of future climate change. As in the case of climate variability, the vulnerability of

agricultural production to loss and damage due to such extreme events – both in terms of loss of production in general, and loss of production and incomes for small, marginal, and medium farmers in particular – is a subject of particular concern. In such cases too, dealing with the impact of climate shock in the present can provide important insights into the future. Global temperatures are rising, as also the occurrence of extreme temperature events when temperatures rise above the mean. Global warming is also contributing to the increase in extreme rainfall events in terms of frequency of occurrence, intensity, and amount of precipitation. Under such circumstances, agricultural research has to play a crucial role in finding solutions to these extreme climate events.

Dev (2012) in his paper suggests that in the case of small agricultural holdings Government has to play an important role in improving productivity and incomes of small farmers. The 11th Five Year Plan says that the agricultural strategy must focus on the 85 percent of farmers who are small and marginal, increasingly female, and who find it difficult to access inputs, credit and extension or to market their output. While some of these farmers may ultimately exit from farming, the overwhelming majority will continue to remain in the sector and the objective of inclusiveness requires that their needs are attended to.

The National Commission for Enterprises in the Unorganized Sector (NCEUS) has recommended a special programme for marginal and small farmers (as in Dev 2012). The report of NCEUS analyses the status and constraints faced by marginal and small farmers and focuses on the need for a special programme which aimed at capacity building of these farmers, both through farm and non-farm activities, as the marginal and small farmers suffer from market failures in agriculture in terms of credit, input supplies and marketing of output, new technologies etc. NCEUS recommended four measures: (a) special programmes for marginal and small farmers; (b) emphasis on accelerated land and water management; (c) credit for marginal and small farmers; (d) farmers' debt relief commission (ibid).

Mishra (2013) in her study concludes that, in a healthy

farm system, agriculture works in harmony with the natural environment. This begins with healthy soil that stores water and nutrients and provides a stable base to support plant roots. In a sustainable system, soil is kept in balance. Crops are rotated through the fields to replace nutrients in the soil. Where there is livestock, animals graze the land, then waste from those animals is used to fertilize the soil. The idea is that as farmers take from the land they also give back. Industrial farms disregard that need for balance. Land is used continuously and not given proper rest. Crops are not rotated in a way that replenishes the soil. Manure and chemical fertilizers are used to "feed" the soil, but through over-application these additives become a problem. Organic, mechanical, physical and cultural practices of agriculture are mainly used in ecological agriculture. Chemical fertilizers and chemical pesticides not only contaminate surface water, they also affect fish population and human health as well. To regain the lost ecological status, it is time to start ecological agriculture without further delay. Incidentally some NGOs and government organisations (GOs) who have already shown much concern to the devastating effect of indiscriminate use of chemical fertilizers and pesticides, earnestly feel of the need for developing an alternative agricultural strategy that is sustainable, productive and environment-friendly.

Some of the eco-friendly agricultural practices could be, crop rotation, use of organic manure, use of decomposed organic matter as manure, recycling animal manures and other biological wastes, soil conservation, rain water harvesting in ponds etc. The government of India has to take some measures to save the agricultural land. Such land should not be allowed to be used for any other purpose besides farming. There is too much of population pressure on land. Houses are being constructed everywhere including on agricultural land and even in the forests. Today people are selling their arable land for money. Besides this, as the population is increasing the demand for food grains is also increasing. Incentives should be given for the farmers to cultivate crops throughout the year so that the agricultural land does not remain fallow. Every state should also take the initiative

of encouraging farmers by giving rewards for those farmers who produce maximum crop. Some years ago agriculture was practiced for subsistence, but now people have got jobs in the other sectors like tourism, service etc. And hence the need for undertaking agricultural production has disappeared at the household level. The current "educated generation" may not like to work in the fields. Hence people engaged in agricultural activities are going on reducing. Under such circumstances the policymakers have to play a crucial role in formulating such policies which will attract the unemployed youth and the land owners towards undertaking agricultural production. The government has to play the role of a catalyst in initiating certain reforms towards reviewing the agricultural sector before the situation goes out of control.

Conclusion

Based on this study it is clear that the agricultural sector which was dominating the Indian economy some years ago has already started losing its importance. Not only our agricultural production has reduced, but in terms of exports, other nations have surpassed us. This is because this sector has been surrounded by vast number of challenges. The agricultural sector has the potential to provide employment, food commodities and export earnings, but it needs to be revived. What is required at this stage is a serious effort from the stakeholders in terms of understanding the problems, their causes, the possible solutions and more importantly the importance of this sector. This sector requires proper planning, in terms of research, provision of monetary benefits and implementation of developmental schemes, so that in the long run the agricultural sector develops and it helps the Indian economy to achieve sustainable development.

REFERENCES

Ahmad, Firdos and Shaukat Haseen (2012). The performance of India's food grains production: A pre and post reform assessment. *International Journal of Scientific and Research Publications*, 2(3).

Ahmad Naseer Rather, Parvaze Ahmad Lone, Ajaz Ahmad Reshi, Muzafar Manzoor Mir (2013). An analytical study on production and export of fresh and dry fruits in Jammu and Kashmir. *International Journal of Scientific and Research Publications*, 3(2).

Bassi, Nitin (2015). Irrigation and energy nexus, solar pumps are not viable. *Economic and Political Weekly*, Vol L (10).

Dev, S. Mahendra (2012). *Small farmers in India: Challenges and opportunities.* Indira Gandhi Institute of Development Research, Mumbai, http://www.igidr.ac.in/pdf/publication/WP-2012-014.pdf

Ghufran, Ali and Syed Fahad Ashraf (2012). Impact of global economic crisis on export diversification of agricultural commodities: The case of Indian horticulture market. *IOSR Journal of Business and Management*, 2(2).

Hosam, E. A. F. Bayoumi Hamuda, István Patkó (2010). Relationship between environmental impacts and modern agriculture. *Óbuda University e-Bulletin* 1(1).

Jayaraman, T. and Kamal Murari (2014). Climate change and agriculture: Current and future trends and implications for India. *The Journal of the Foundation for Agrarian Studies*, 4(1).

Korikanthimath, V.S. (2009). New agricultural options for value added agriculture in Goa. *Report on the Interactive Meeting* held on 7 July at International Centre, Goa. Retrieved from: www.internationalcentregoa.com/pdf/Report-Agriculture.pdf

Marshall, Fiona, Mike Ashmore and Fiona Hinchcliffe (2003). A hidden threat to food production: Air pollution and agriculture in the developing world. *Gatekeeper Series No. SA73.*

Nagaraj, K. (2008). *Farmers suicides in India: Magnitudes, trends and spatial patterns.* Madras Institute of Development Studies. Retrieved from: www.macroscan.org/anl/mar08/pdf/Farmers_Suicides.pdf

Mishra, Mandavi (2013). Role of eco-friendly agricultural practices in Indian agriculture development. *International Journal of Agriculture and Food Science Technology*, 4(2).

Parvathi, C. and K. Arulselvam (2013). A situational analysis of agricultural production and food security in India. *Researchers World - Journal of Arts, Science & Commerce*, IV [1(1)].

Prasad, N. Purendra (2015). Agrarian class and caste relations in 'United' Andhra Pradesh, 1956-2014, *Economic and Political Weekly*, Vol L(16).

Sharma Paul Vijay (2011). India's agricultural development under the new economic regime: Policy perspective and strategy for the 12th five year plan. *W.P. No. 2011-11-01*, Indian Institute of Management, Ahmedabad.

Shinoj P. and V.C. Mathur (2008). Comparative advantage of India in agricultural exports vis-á-vis Asia: A post-reforms analysis. *Agricultural Economics Research Review*, Vol. 21: 60–66. Retrieved from: ageconsearch.umn.edu/bitstream/47361/2/9-Shinoj-P.pdf.

Srivastava, Sunita and Om Prakash (2014). Impact of recession on Indian agricultural exports. *International Journal of Business and Administration Research Review*, 2(7).

Shiva, Vandana and Kunwar Jalees (2012). *Farmers suicides in India*. Research Foundation for Science, Technology and Ecology, New Delhi. Retrieved from: www.navdanya.org/attachments/Organic_Farming10.pdf

RECYCLED ASPHALT PAVEMENTS AND THEIR RELEVANCE FOR ADOPTION IN INDIA

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ABSTRACT

India has committed to an ambitious plan of developing its existing network of roads which is the second largest in the world. Great strides have been taken by developed countries in perfecting Recycled Asphalt Pavement (RAP) technology, demonstrating good performance, reaping substantial savings and engaging in environment friendliness through recycling of RAP. Recycled RAP has enjoyed popularity in the US and European countries for decades. In contrast, India has little experience in this technology and has the need to systematically adopt it in the near future. Publications such as IRC: 37 (2012) and IRC: 81 (1997) reveal status quo in RAP technology in India a few years back. The IRC has just begun to set the stage for implementing RAP through its publication of IRC: 120 (2015). The use of RAP in the pavement industry is not mandatory and compelling factors such as substantial savings, legal and environmental restrictions will serve to legislate the use of RAP. In the interim, it can be stated that conventional overlays are a wasteful practice to be discontinued.

Keywords: CP; CR; evaluation; HR; HIR; IRC; RAP legislation; pavement structure; performance; rehabilitation

Introduction

The National Highways are the backbone of the road infrastructure and major roads in India. They carry most of India's freight and passenger traffic. State highways and major district roads constitute the secondary and interconnecting roads in India.[1] India has the second largest road network in the world spanning 4.87 million kms (Roads 2015). Over 60 percent of all goods and 85 percent of all passenger traffic flow through these transportation corridors.

The road network in India can be broadly categorized into State Highways, National Highways and District and rural roads. The National Highways in India account for 1.9 per cent of the total road network amounting to 97,135 kms in 2015 and is expected to increase to 100,000 kms by the end of the 2017(Roads 2015). The government of India has a seven stage plan called 'National Highway Development Project' (NHDP) to develop National Highways in the country. The National Highway Authority of India (NHAI), a government agency, is responsible for construction maintenance and development of highways. Given these ambitious plans it would be prudent to take advantage of opportunities that exist in savings through reuse of existing asphalt resources in pavements that are to be constructed or rehabilitated.

The objectionable part of road development or maintenance is the burying of old asphalt roads under new pavement material. This results in increase in road elevations in relation to adjoining structures which is noticeable in cities and rural areas where routine maintenance consists of surfacing over and above existing road surfaces. Although recycling asphalt is beneficial, that part which is not recycled is used as fill material or stockpiled in landfills. Storing RAP in landfills has its problems of leachate leaking when rainfall infiltrates stockpiles (Townsend 1998).

Asphalt recycling is one of the ways of rehabilitating existing roadways. Despite the use of Reclaimed Asphalt Pavement (RAP) in other countries, asphalt pavement recycling is yet to dominate the stage in India (Kandhal 2012).

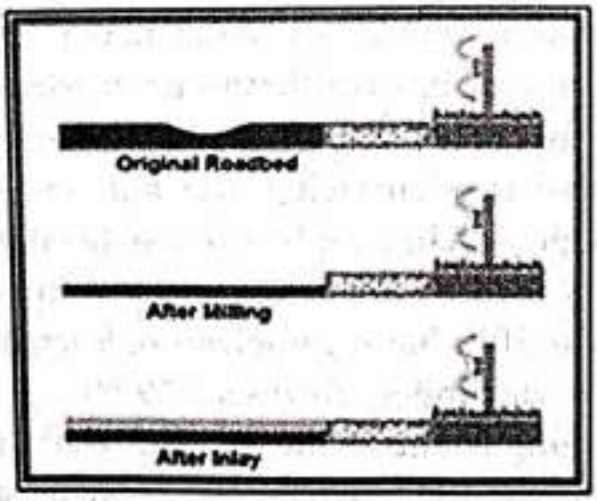
This paper surveys various aspects of RAP, its benefits in terms

of economics and performance and its widespread use abroad, the status quo in India and the need for awareness and legislation to ensure its prevalent use (it should be noted that some numerical and monetary data reported are subject to change on account of continual development in RAP technology but serve to give an indication of relative magnitudes).

Cold Planing and Inlaying with RAP versus Conventional Overlaying

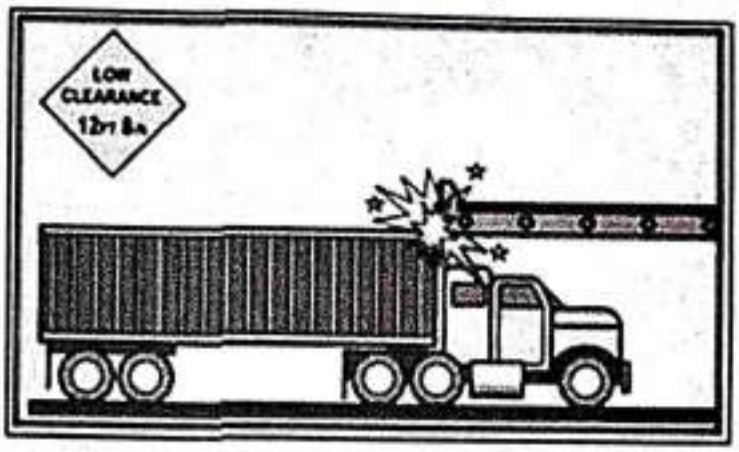
Where recycling of RAP is not implemented, the status quo in the pavement industry is to overlay existing roads resulting in burial of precious resource material. On the other hand if recycling of RAP is adopted, there are benefits to be reaped. In order to recycle RAP, it has to be removed by cold planing (CP). CP is defined as the controlled removal of existing pavement to a desired depth, longitudinal profile and cross slope (ARRA 1992). CP followed by inlaying is the better option as it does not disturb road elevations and preserves clearances and elevation differences with adjacent structures. Figure 2.1 shows the benefit of CP followed by inlaying. This does not require the raising of shoulders and adjoining structures.

Figure 2.1 CP and Inlaying



Source: Brock and Richmond (undated)

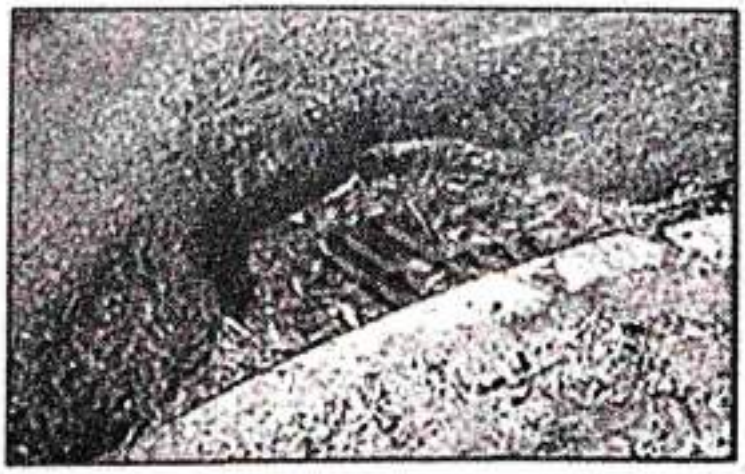
Figure 2.2: CP preserves clearance heights



Source: Brock and Richmond (undated)

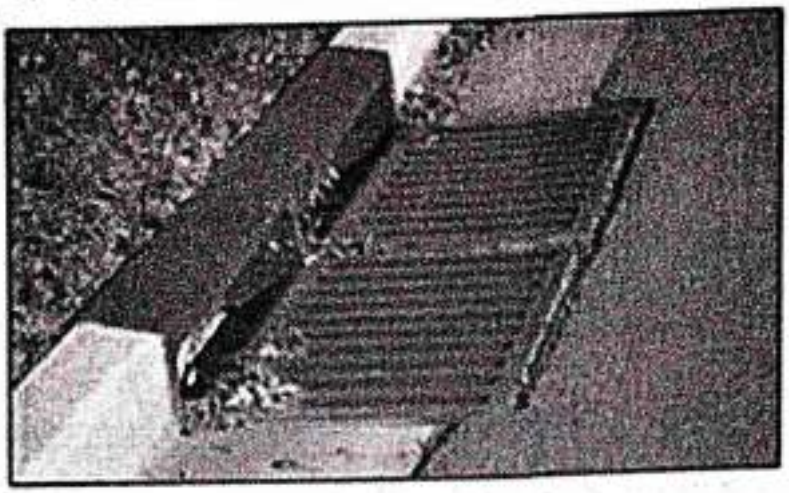
Figure 2.2 shows the effect of overlays on overhead clearances where there is the need of raising elevation of overhead structures. Figure 2.3 shows the adverse effect of overlays on drainage resulting in blockages. In contrast figure 2.4 shows the benefit of CP to maintain levels around access to drainage utilities. Figure 2.5 shows the benefit of preserving manhole elevations. Overlays would require raising the manhole which comes at a cost. In spanning structures overlays add to the dead load.

Figure 2.3: Multiple overlays around drains



Source: Brock and Richmond (undated)

Figure 2.4: CP around drains

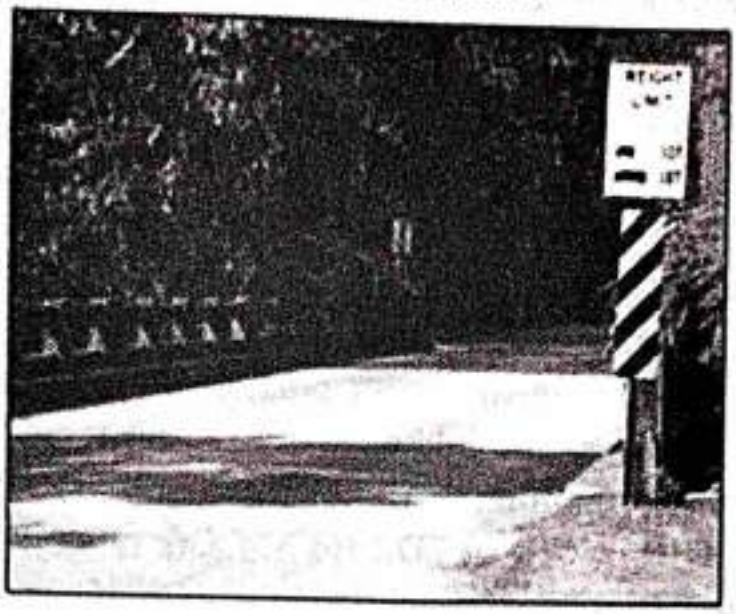


Source: Brock and Richmond (undated)

Figure 2.5: CP around manholes

Source: Brock and Richmond (undated)

Figure 2.6: CP keeps Dead Loads constant



Source: Brock and Richmond (undated)

Pavement Failures due to Overlays

The various classifications of pavement failures are cracking, distortion, disintegration and surface defects. Cracks are of different types and it is important to recognize the type of crack in order to select a rehabilitation method for roads in distress (Christopher and Kearney 2004). The different types of cracks are reflective, alligator, thermal, block, linear, edge and slippage. Of interest are reflective cracks caused by temperature and moisture variations or vertical translations due to traffic loads. Pavement distortion is the result of movement due to asphalt mix instability, weak base or subgrade and manifests as rutting and shoving (ibid). A rut is a longitudinal surface depression on the path of the wheel which may be due to transverse movement (Johnson 2000).

Reflective cracks occur when overlays are placed on cracked pavements. The cracks are reflected quickly to the surface (Christopher and Kearney 2004). If an overlay is placed over a rutted pavement, cracking and re-rutting will occur (Brock and Richmond undated). The surface of the overlay will deform to takes on the shape of the rutted surface below.

Asphalt Recycling as rehabilitation Methods for Pavement Failures

As discussed in Section 3, CP followed by inlaying is the preferred way of rehabilitating a pavement. There are five broad categories of asphalt recycling methods namely Hot Recycling, Hot In-Place Recycling (HIR), Cold Recycling (CR) and Full Depth Reclamation (FDR). Asphalt recycling methods can also be used together. One combination is milling the upper portion using CP followed by stockpiling the same. The cold planed surface is then inlayed with Hot Recycling containing RAP. Alternatively the CP could be followed by HIR or CIR or FDR (to mitigate reflective cracking) (ARRA 2001).

All the above mentioned methods offer advantages over conventional rehabilitation methods (Kandhal 1997). However, it is necessary to have a comprehensive evaluation of existing pavements before attempting any recycling method. Only when this preliminary is done, can a recycling method be selected. The choice of method depends on the distress the pavement is undergoing as well as its severity. Each pavement recycling method is suited for treating different types of distresses (ibid). The primary types of distresses are surface defects, deformation, cracking, maintenance patching, base/subgrade problems, and poor ride/ roughness (ARRA 1992). Hot Recycling can be used to treat all types of distresses except those occurring in base or subgrade. HIR can be used for all but reflection cracks and distress in base or subgrade. CR and FDR are capable of treating rutting. Only FDR can be used to rectify base or subgrade problems (ibid).

Performance of RAP

Good performance is attained only when good project selection criteria were followed; and pavements were well designed and constructed with quality control i.e. with no defects or irregularities.

The Federal Highway Administration of the US Department of Transportation has conducted a literature search to collect

the results of performance evaluation of recycled projects in the different states of the US and has concluded the following:

> The experience of the different states indicates that in most cases the performance of the recycled asphalt pavements has been superior to or comparable to conventional asphalt pavements. However, it was also observed that recycled pavements performed well only when good projects selection criteria were followed, and they were designed properly and constructed under good quality control and acceptance conditions. Hence, the conclusion from this literature review is that, as in the case of conventional asphalt pavements, recycled asphalt mixtures must be designed to meet proper specifications, produced with good quality control, and placed properly with no defects or irregularities.[1]

Economics of RAP

All RAP methods when chosen properly result in savings over traditional methods. In addition, relative savings are gained depending on the type of recycling technique used.

Table 6.1 Cost comparison of virgin and RAP mix[2]

Item	Cost per ton ($)	Percent used (%)	Total Cost ($) per ton
Aggregate	5.00	94	4.70
Asphalt Binder	120.00	6	7.20
Virgin Mix			11.90
RAP			
Trucking	2.00		2.00
Milling	1.70		1.70
RAP Mix			3.70
Savings in using 1 ton of RAP instead of 1 ton of virgin mix			8.20

When HR and Cold Mix recycling are used there is a saving as opposed to using virgin asphalt.

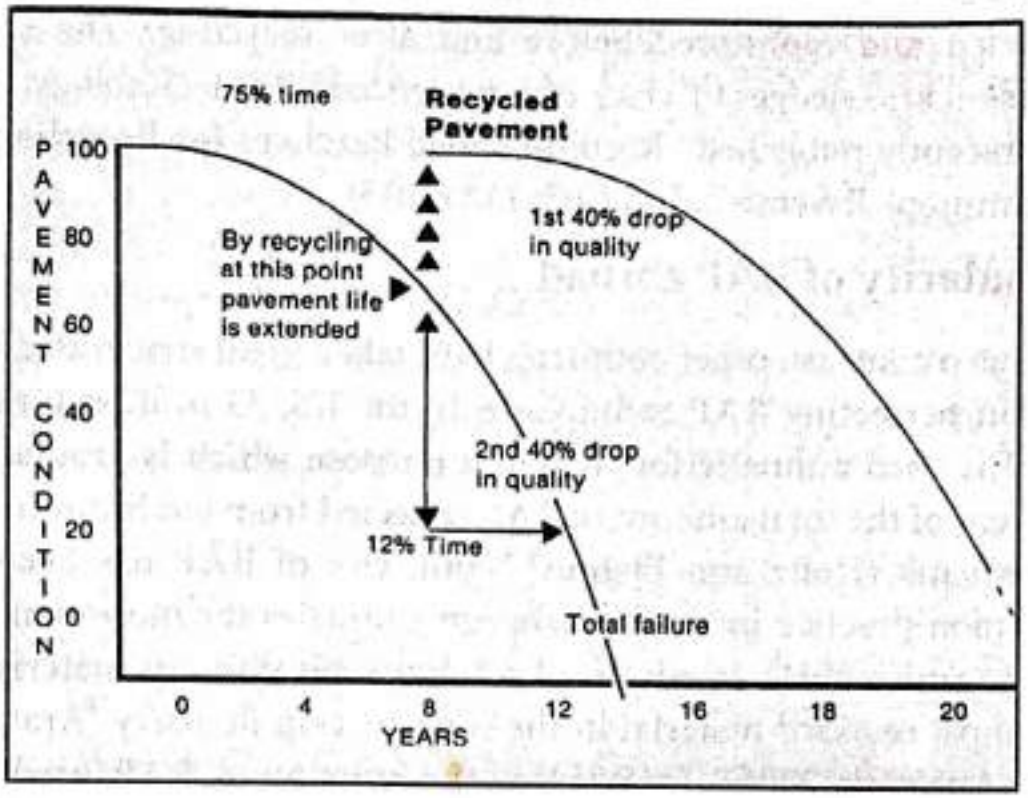
Table 6.2 Savings in the use of varying percentages of RAP[2]

Percent of RAP	Cost/Ton	Savings, $/ton	Savings, %
0%	11.90		
20%	10.26	1.64	14
30%	9.44	2.46	21
40%	8.62	3.28	28
50%	7.80	4.10	34

HIR and CIP methods eliminate the need of transportation cost and a little virgin material. CIP has the additional benefit of eliminating of fuel, emissions as it is done at ambient temperature.[2]

Table 6.1 depicts the cost benefit of RAP on a material cost basis. It considers two options namely, the CP and stockpiling of milled surface; and use of virgin materials. Noteworthy is that the option of CP with stockpiling is the most expensive of all the recycling options. Table 6.2 shows relative increase in savings in using varying percentages of RAP. With 20 percent recycled RAP the saving is 14 percent whereas with 50 percent recycling of RAP the saving is 34 percent.

Figure 6.3 Pavement deterioration and recycling rehabilitation v/s time[3]



Studies have also shown that timely maintenance of pavements at a certain acceptable level of serviceability results in substantial savings (ARRA 1996).[3] A study reveals that $ 1.00 spent on pavements over a certain maintenance period which results in 40 percent drop in original quality, will cost $ 4.00 to $5.00 if the maintenance period is delayed until pavement loses 80 percent of original quality (ibid).

Implementation of RAP in India

Clause 1.4 of IRC: 37(2012) highlights the restrictions on the availability of aggregates due to environmental concerns and legal restrictions on quarrying. Despite this India has not been in the forefront in capitalizing on this precious resource. There is however an increased acceptance of this trend and may require demonstration of its performance in experimental projects before witnessing its prevalent use.

Clause 1.4 of IRC: 81(1997) mentions that the use of recycled bituminous layers is a recent practice in India. It has referred

to an experimental project on RAP on NH6 in the vicinity of Kharagpur where in some stretches the top portions were milled, recycled and monitored before and after recycling. The same clause acknowledges to a lack of experience in this technology. IRC has recently published "Recommended Practices for Recycling of Bituminous Pavements" in IRC: 120 (2015).

Popularity of RAP abroad

In sharp contrast, other countries have taken great strides decades ago in perfecting RAP technology. In the US, 33 million tons of RAP is used annually for recycling purpose which is around 80 percent of the total amount of RAP collected from old bituminous pavements (Holtz and Eighmy 2000). Use of RAP has become common practice in many European countries for more than 30 years (Smith 2011). In advanced countries, bituminous material is the most recycled material in the construction industry (Aravind and Animesh 2006). In Sweden, the amount of RAP used for recycling per year is about 0.84 million tons in Sweden, 7.3 million tons in Germany, 0.53 million tons in Denmark and around 0.12 million tons in Netherlands (ibid). In the year 1995, 20 million tons of recycled hot mix was produced in Japan, which constituted 30 percent of the total hot mix production (Ikeda and Kimura 1997).

Legislation of RAP

Kandhal (2012) is skeptical about the use of Hot Mix Recycling in India unless legislation by NHAI mandates its use on all major projects. Opponents of recycled RAP may put many arguments against its use. One of the arguments is that RAP is a new technology and there is lack of experience. Another is that Recycled hot asphalt mix may be inferior to virgin mix. Yet another argument is that there is no IRC specification on hot asphalt recycling. This argument was valid prior to the publishing of IRC: 120 (2015). These arguments were addressed by Kandhal (2012). It could also be argued that NHAI engineers, contractors and consultants are not trained in hot mix recycling. This was addressed by Kandhal and Mallick (1997).

According to Saride and Balunaini (2010), there is need of awareness in the Indian pavement industry, of recycling processes and to demonstrate the benefits attainable through performance monitoring. Ibid proposes that workshops be organized to transfer knowledge from research to local transportation agencies. Another proposal is to develop performance based design methodologies for recycled materials.

The Federal Highway Administration of the US department of transportation has a material recycle policy that promotes asphalt pavement recycling and technology.[3]

Holtz and Eighmy (2000) wrote:

> A number of states have passed legislation to look more closely on the state level at recycling within the highway environment. Pennsylvania, for example, recently passed legislation promoting recycling. From recent conferences in Austin, Texas, in 1998; Harrisburg, Pa., in 1998; and Albany, N.Y., in 1999, it is apparent that state departments of transportation (DOTs) and state environmental protection agencies (state EPAs) are trying to balance the desire for increased use of recycled materials with concerns about potential environmental impacts.

According to ARRA (2001):

> Many countries have already enacted legislation which requires that certain percentages of materials, particularly the ones used in roadway construction and rehabilitation, must be recycled or include recycled materials. By demonstrating the technical viability, the savings in energy and non-renewable natural resource (crude oil and granular materials) and the cost savings associated with asphalt recycling, progress towards one of society's goals of environmentally responsible construction processes will be achieved. It is noted, that asphalt pavements are presently the most commonly recycled material in North America.

Denck (undated) wrote:

> Under German National Law on Recycling and Waste, departments within local councils are required to increase the proportion of waste recycled. Furthermore, laws require the use of any recyclable material in the highest possible position of any value chain. Asphalt is a recyclable material and is therefore subject to this legislation. Hamburg has taken a significant step forward to encourage an increase of recycling rates in construction materials by establishing an online exchange for soil, debris & construction materials.

In Japan, the use of RAP is required by "Law Concerning the Promotion of Procurement of Eco-Friendly Goods and Services by the State and Other Entities (Law on Promoting Green Purchasing)" which was enacted in the year 2000 (Kubo 2009).

Conclusion

Literature on the use of RAP in India is scarce. However, the Indian Road Congress, Ministry of Road Transport and Highways in its publication of IRC: 37 (2012) acknowledges the need to shift from conventional means to the use of RAP and engineered aggregates on existing pavements, due to legal and environmental restrictions. There is limited experience in the use of RAP. However, the publication of recommended practices for RAP has only recently emerged in IRC: 120 (2015). It seems that progress has been made in India to establish a technical framework for the adoption of recycling of RAP. One such effort is that of IRC: 81 (1997) which is a research scheme on 'Structural Evaluation of Pavements in Eastern India using Falling Weight Deflectometer' (FWD) that seeks to carry out structural evaluation of pavements in a non-destructive manner using its indigenously made FWD tool.

Although the recycling of RAP is mandated by law in countries such as US, Germany and Japan within the context of responsibility to the environment, it is hard to find one in India as it is too early to do so. Despite the strides other countries have taken in perfecting and using RAP, technical bodies such as Indian Roads Congress

will learn from the advances in technology abroad and improvise/ adopt them to suit Indian conditions besides incorporating its own research findings. Although it is amply clear from section 6 that use of RAP yields substantial savings, and that there are practical difficulties associated with overlaying as seen in Section 2, legislation of the use of RAP can only begin once experience in use of RAP is gained and its performance is proved in the Indian context. If legislation is not imposed the choice of using RAP is optional. However, virgin material shortages and cost of bitumen, economic gains from use of RAP along with environmental concerns put forth by environment protection agencies, will serve to accelerate legislation on use of RAP in India. In the interim, given the benefits of recycling RAP, from economic, environmental and practical aspects, it can be stated that overlaying of pavements is a wasteful practice that needs to be discontinued in the very near future.

NOTES

1. As in http://www.fhwa.dot.gov/pavement/recycling/98042/CHPT_02.pdf
2. As in http://www.fhwa.dot.gov/pavement/recycling/98042/CHPT_04.pdf
3. As in http://www.fhwa.dot.gov/pavement/recycling/98042/CHPT_01.pdf

REFERENCES

Aravind, K. and Animesh, D. (2006). Bituminous pavement recycling. Retrieved from: http://www.researchgate.net/publication/238523374.

ARRA (2001). *Basic asphalt recycling manual 2001.* Asphalt Recycling and Reclaiming Association.

ARRA (1992). *An overview of recycling and reclamation methods for asphalt pavement rehabilitation.* Asphalt Recycling and Reclaiming Association.

Brock, J.D. and Richmond J.L. (undated). *Milling and recycling*, Technical Paper T-127, ASTEC Inc.

Christopher, B. and Kearney E. (2004). *Asphalt paving principles*, Cornell Local Roads Program, New York Ltap Center. Retrieved from: http://www.clrp.cornell.edu/workshops/manuals/asphalt_paving_principles.pdf.

Denck, C. (undated). *Recycled asphalt used for road resurfacing: GPP in Practice.* European Commission. Retrieved from: http://ec.europa.eu/environment/gpp/pdf/news_alert/Issue28_Case_Study60_Hamburg_recycled_asphalt.pdf.

Holtz, K. and Eighmy, T.T. (2000).Scanning European advances in the use of recycled materials in highway construction, *Public Roads*, 64 (1): 34–40.

Ikeda, T. and Kimura, M. (1997). Recent developments in recycling asphalt pavements in Japan. *Proceedings of 8th International Conference on Asphalt Pavements*, Seattle, Washington, pp. 99–106.

IRC: 120 (2015). *Recommended practices for recycling of bituminous pavements.* New Delhi: Indian Road Congress.

IRC: 37 (2012). *Guidelines for the design of flexible pavements.* New Delhi: Indian Road Congress.

IRC: 81 (1997). *Ministry of road transport and highways research scheme.* New Delhi: Indian Road Congress.

Johnson A. (2000). *Best practices handbook on asphalt pavement maintenance.* Minnesota Technology Transfer (T2) Center / LTAP Program Center for Transportation Studies, University of Minnesota.

Kandhal S.P. (1997). Recycling of asphalt pavements – An overview. *Technical Journal of the Association of Asphalt Paving Technologists, Asphalt Paving Technology*, Volume 66. Retrieved from:http://www.scribd.com/doc/34629021/Recycling-of-Asphalt-Pavements-An-Overview#

Kandhal, S.P. (2012). Hot mix recycling of asphalt pavements: It's long overdue in India! *NBM&CW.* Retrieved from: https://www.academia.edu/8049005/Hot_Mix_Recycling_of_Asphalt_Pavements_Its_Long_Overdue_in_India.

Kandhal, S.P. and Mallick R.B. (1997). Pavement recycling guidelines for state and local governments. *Federal Highway Administration Report FHWA-SA-98-042.*

Kubo, K. (2009). Recycling in Japan. *International Workshop ISAP Technical Committee APE Asphalt Pavements and Environment*, Qingtao, China, [legislation & use of RAP in world].

Roads (2015). Indian Brand Equity Foundation. Retrieved from: http://www.ibef.org/download/Roads-August-2015.pdf.

Saride, S. and Balunaini U. (2010). *The first US-India workshop on global geoenvironmental engineering challenges*, New Delhi, India.

Smith, P. (2011). *Increased use of recycled asphalt pavement technology.* Aggregates Business Europe. Retrieved from: http://www.aggbusiness.com/EasySiteWeb/HandleRequest/categories/quarry-products/features/increased-use-of-recycled-asphalt-pavement-technology/

Townsend, T.G. (1998). Leaching characteristics of asphalt road waste. *Florida Center for Solid and Hazardous Waste Management, Report #98-2.*

CUSTOMER RELATIONSHIP MANAGEMENT IN HEALTH CARE SECTOR IN GOA

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ABSTRACT

Health care is one of the basic needs of any society and hospitals play a major role in providing for this need. India is turning out to be a major medical tourism destination for the western world. With many new private hospitals coming up in India the health care sector is facing tremendous competition and so management of these hospitals has become a challenge for the administrators. Customer Relationship Management (CRM) provides the opportunity to organizations to face such challenges and be in constant touch with its customers. A number of top hospitals worldwide are using CRM to manage their patients. This research is undertaken to find out how the hospitals in Goa are performing in terms of managing their patients. The data is collected by observation method and findings are presented in the form of a case. The findings show that Goa lacks immensely as far as patient management is concerned. Hospitals in Goa need to employ the CRM strategies to improve health care management in Goa.

Keywords: customer relationship management; health care; hospitals; patient relationship management

Introduction

Customer relationship management (CRM) is an approach that focuses on maintaining one on one relationship with the customers, and integrates databases with a long term customer retention and growth strategy. Hospital administrators the world over have realised that patients are an important part of hospital management. In hospitals, taking care of patients' requirements, providing them with necessary information, helping them choose the right doctor, turning them into loyal patients are issues handled using patient relationship management (PRM) – a term used in hospitals where the keys customers are the patients (Saiu 2003).

Sheth and Parvatiyar (1995) have observed that relationship marketing has historical antecedents going back to pre-industrial period and started with agricultural products. According to Jobber (2004) CRM is an ancient approach. Merchants in the earlier days would take care of their customers knowing that if they do so their customers will keep coming back to them. Gronroos (2004) suggested that CRM can offer more security, control, sense of faith and it also minimizes risks and costs. It builds brand equity and good reputation.

Dasha et al (2011) had stated that CRM is as important for hospital services as it is to other organizations and business. Almunawar and Ansari (2011) have proposed a social CRM model for improving customer services for mutual benefits between healthcare providers and their customers. They further state that managing patient – hospital relationships can create emotional support, get substantial aid, advice and information to deal with problems. Because of the use of technology CRM can also enable collaborative treatment from telemedicine.

This research is undertaken to find out whether the hospitals in Goa are practising CRM considering its benefits to both the patients as well to the organization.

Objectives

1. To find whether hospitals in Goa practice the PRM approach.
2. To find whether PRM is predominant in private hospitals.
3. To find how PRM can help hospitals perform better.

Methodology

For objective one and two, primary data is collected by observation method from three hospitals in Goa. The significance of observation is that it allows researchers to study people in their own surroundings so that they can evaluate "things" from their viewpoint (Baker 2006). Gorman and Clayton (2005) have stated that observation studies are those that "entail the logical recording of apparent occurrence or deeds in a natural setting". Primary data is also collected by interacting with the patients and staff of the hospitals. Hospital A is a government hospital situated in Margao, Goa. Hospital B too is a government hospital and is situated near Panjim, Goa. Hospital C is a private hospital chain situated in Margao, Goa. The data is collected from the period, October 2014 to January 2015, and July 2015. Findings are presented in the form of a case. The case is analysed by relating the findings to existing literature. As indicated by Yin (1984) case studies (may) utilize an embedded design, that is, multiple levels of analysis within a single study. For the purpose of *objective iii*, secondary data on CRM in hospital management is analysed.

Case

Goa is one of India's richest states with a Gross Domestic Product (GDP) per capita two and a half times that of the country as a whole. It was ranked the best placed state by the Eleventh Finance Commission for its infrastructure and ranked on top for the best quality of life in India by the National Commission on Population based on the 12 Indicators.[1]

According to Directorate of Health Services (DHS) website,[2] Goa is considered as one of the best states in the subject of health and medical care. DHS has an important responsibility

in the provision as well as administration of health services. It is responsible to elevate the quality, broaden accountability and carry out the services fairly, efficiently and politely. Goa also has one of the most widespread health systems in India. Recently, the state is observing a speedy rise in chronic diseases such as cancer, heart disease, and mental health problems, and addressing these issues requires far more than mere infrastructure and elementary support.

1. Hospital A

Located in Margao city, this hospital caters to the needs of patients in South Goa District. The 270 bedded hospital is run by the Government. It is equipped with Operation Theatres, ICU, X-ray machine, CT Scanner etc. It provides outpatient, inpatients and emergency services to citizens of Goa. The doctors and staff working there are under the payroll of the government. The hospital is located in the heart of the city but the approach to the hospital is narrow. This itself poses problems, as during peak hours due to traffic jams the ambulances or patients' vehicles are not able to navigate through the traffic. The building of the hospital is in a dilapidated state and no renovation has been done for years. The functioning of the hospital is highly lethargic. There is no sense of urgency or care shown for the patients. The doctors, nurses and the support staff fail to show any empathy towards the patients. There are less hospital beds and more patients; as a result one can see patients often lying on the floor. Cleanliness is another major issue. The hospital lacks basic sanitations; while there are no proper dustbins, toilets are filthy and linen on beds is rare. Many a times the linen is patient's own. The record of the patients is not maintained and hence the count as to how many number of times a patient has come is not known. Patients and doctors in some cases maintain relationships that go beyond one visit, but most patients are neglected. With respect to 108 ambulance services, complete protocols are not maintained. The ambulances are not fully equipped. During calls the lady nurse goes alone and also there is no help in case the patient has to be carried on a stretcher

or on a wheel chair. The condition is worse during night when such services are required the most. During nights the doctors on duty take about half an hour (approx) to come to see the patient hence valuable time is lost.

2. Hospital B

Located near Panjim city, this government owned hospital caters to patients not only from Goa but also from neighbouring states of Maharashtra and Karnataka. The hospital promises to provide quality services and medical care to each and every citizen who visits the hospital. Equipped with latest equipments and qualified doctors, the hospital also has a blood bank, laboratories and mortuary. It provides outpatient, inpatients and emergency services to citizens of Goa.

Registration for OPD patients is centralised. Patients are given a case paper with a unique patient number which can be used every time they visit the hospital and avail services of any department. The hospital boosts of specialists doctors who are best in their fields. But the same cannot be said about the nurses and the support staff. Very few nurses are dedicated to their duties, others do not have any empathy for the patients. The support staffs working in the wards of the hospital are hardly present. Relatives of the patient are seen taking the patients on wheelchair or stretchers. It is also heard that the many male members of the support staff signs in for duty but later sneaks out of the hospital and works privately. The building of the hospital is partially in a dilapidated state specially the ICUs. The walls of the hospital get damp during rains causing more harm than good to the patients. While many wards of the hospital do have a good view overlooking the sea, cleanliness is a major issue. While the hospital lacks basic sanitation, there are no proper dustbins, toilets are not as clean as they should be and linen on beds is rare. Many a times the linen is patients own, as in Hospital A. Recently there were reports in the local dailies that suggested that the doctors of the hospital were carrying out clinical trials on patients without their knowledge. These doctors are said to be sponsored by big pharmaceutical companies.[3]

3. Hospital C

Located in Margao this 150 bedded hospital was originally a member of a private hospital chain having specialities like interventional cardiology and cardio vascular surgery, intensive medicine, emergency medicine, orthopaedics, etc., apart from the basic services provided in all hospitals. Some of the allied facilities provided include laboratory services, imaging facilities, pharmacies and ambulances. The hospital also provides outpatient, inpatient and emergency services. With the hospital being located next to railway lines, the surroundings are not very clean. Each patient after registering is given a unique ID for identification which the patient can use whenever the patient avails of the hospital facility. The hospital is well maintained, clean and spacious. While the doctors and nurses take good care of the patients and are seen to empathise with the patients, the resident doctors are not very experienced and are not empowered enough to take their own decisions. The support staff members are helpful and do their duty with honesty. An area where the hospital is deficient in is, is that they do not have a well trained administrative staff. The personnel manning the reception counter and cashier's desk are often rude. The hospital is perceived to be expensive by the locals. Many patients feel that the money charged for the services provided (even at the OPD) is on the higher side. The charges of the doctors vary according to the number of times the patients visit the hospital in the same month.

Case Analysis

The case points out the conditions prevalent in the three well know hospitals in Goa. The first two hospitals being government hospitals do have relatively more limitations than *Hospital C* which is privately owned. A comparative analysis of the three hospitals is given in Table 1.

Table 1: Comparative Analysis of the three Hospitals

Sr. No	Feature	Hospital A	Hospital B	Hospital C
1	Good location	√	√	√ (less)
2	Facilities	Less (compared to Hospitals B & C)	√	√
3	Specialists doctors	√	√	√
4	Qualified & well trained nurses	√ (less)	√ (less)	√
5	Good support staff	-	-	√
6	Patient registration	√ (sometimes)	√	√
7	Patients relations	-	-	-
8	Patient acquisition	-	-	√ (corporate level)
9	Amenities	-	-	√
10	Cleanliness (general)	-	-	√
11	Clean toilets	-	-	√
12	Sense of urgency	-	-	√
13	Communication with patients	-	-	-
14	Less waiting time	-	-	-

Yes (√) No (–)
Source: Authors own research

As seen in Table 1, with respect to location and doctors all the hospitals are on par with each other. However, while *Hospital A* is self sufficient in terms of facilities, when compared to *Hospitals B & C*, it is found lacking. Qualified and well trained nurses, good support staff, amenities, cleanliness, sense of urgency, are major concerns for *Hospitals A & B*. In *Hospitals A & B* though nurses are qualified, all are not committed to their service. Hence this becomes an issue of concern for the hospitals. Patient relationship,

communication with patients and waiting time are incidentally concerns for all three hospitals. With *Hospitals A & B* being government hospitals, there are problems of plenty for *Hospitals A & B*, with customer acquisition not being a priority. With regards to *Hospital C* the primary focus is on acquiring corporate customers, with individual customers being acquired on the basis of advertisements in local newspapers.

In their study Choi et al (2005) found that service quality dimension was the main concern for patients in hospitals. These service quality dimensions included concerns related to: (i) doctors, (ii) staff, (iii) convenience of care process, and (iv) tangibles. Laohasirichaikul et al (2009) based on the same quality dimension suggested that the management should employ the right doctors as specialists as it gives good reputation and positive image for the hospital. They also suggested that the doctors should be given training on interpersonal skills so that they become polite and comforting, and give individual attention to their patients. The management should also employ service oriented nursing staff. The nursing staff and other hospitals staff should also be trained on interpersonal skills to provide care, compassion and courtesy to patients. Additionally, mmanagements should provide clean facilities like patient examination room and toilets (clean and with fresh odor). Hospitals should also provide amenities like public telephones, seating and toilets for both patients as well as their family members. Managements were also required to take care of adequate signages to communicate direction, location name, and room number so that patients can easily find ways to the designated place. The sign must be easy to read and clear. In addition, "convenience of the care process" should be improved especially during the waiting time.

Analysing the findings of this research on the basis of the above classification, to identify perceived service quality with regards to PRM for the three hospitals and then comparing them with each other, it was found that Hospital C can be rated better than the other two as it scores better with regards to doctors concern, staff

concern and on tangibles. As far as convenience for care process is concerned, like the other two hospitals, Hospital C also does not maintain any contact with its patients post medication. Even the interaction with the doctors and staff is limited to patients visit. If in case the patient does not visit i.e. there is no follow up from the patient's side, the hospital too does not send any reminder or enquire about the patient as to why he/she is not coming to the hospital. With respect to waiting time, Hospital A & Hospital B have lengthy waiting times. This is both because of the very large number of patients and doctors not sticking to proper time schedules. Hospital C too also has waiting time issues – but it is on account to improper communication. For example, patients are told to wait for some procedure with the nurses informing them that they will be called according to their numbers; however, the patients find later that they were supposed to submit their files in advance. The patients thus end up sitting for considerable amount of time.

Table 2: Analysis of Perceived Service Quality

Sr. No.	Quality Dimensions	Hospital A	Hospital B	Hospital C
1	Doctors Concern	-	√ (less)	√
2	Staff Concern	-	-	√
3	Convenience for Care Process	-	-	√ (less)
4	Tangibles	-	-	√

Yes (√) No (–)
Source: Authors own research

Ghafari et al (2011) have researched on the relationship between the five dimensions of CRM and innovative capabilities of an organization on the basis of information sharing, customer involvement, long term partnership, joint problem solving and technological support. Information sharing is the exchange of crucial and restricted information between organizations and their customers through communication (Mentzer et al 2000). Customer involvement includes connecting to the customer for

the purpose of the organizations development and improvement. Customers provide market inclinations and all kinds of support for the organizations (Sin et al 2005). Long-term partnership refers to commercial relationships with conviction and assurance between two parties (Handfield and Bechtel 2002). Joint problem-solving can be described as collaboration between organizations and customers for problem solving and also for the distribution of the responsibility when a problem occurs, gets complicated, and/or unpredicted conditions are encountered (Huang and Chang 2008). Technological CRM refers to organizations that use information technology to help different activities of CRM and actively propose technical help including data storage, data mining and CRM software systems to their customers (Sin et al 2005). The three hospitals based on the five dimensions of CRM are analysed and presented in a tabular form in Table 3.

Table 3: Analysis of five dimensions of CRM

S. No	CRM Dimensions	Hospital A	Hospital B	Hospital C
1	Information Sharing	-	-	-
2	Customer Involvement	-	-	-
3	Long Term Partnership	-	-	-
4	Joint Partnership	-	-	-
5	Technological CRM	-	-	√

Yes (√) No (–)
Source: Authors own research

On the basis of the above analysis it can be seen that none of the hospitals are using CRM for PRM. Though all three hospitals have proper procedure to take all patients details during registration, with patients also being given a unique ID, this data is not used later for any other purpose like information sharing, customer involvement, long term partnership, joint problem solving and technological support.

Analysis of Customer Relationship Management in Hospitals

The major visible failure points in all the three hospitals are communication, patient information management and lack of affiliation with the patients. Many researchers have done studies on hospital CRM and have given solutions as to how to manage hospitals better. These suggestions can be implemented to ensure not only good patient-hospital relationship and profits, but also better brand equity. Prof Rene T. Domingo[4] has listed eleven deadly sins of customer service in hospitals and has also given the solution for the same (see Table 4):

Table 4: Eleven Deadly Sins of Customer Service in Hospitals

Sr No	Sins	Solutions
1	Multi-stop Service	One stop shop, flawless patient service
2	Reactive Service	Proactive service, non medical needs of the patients can be predicted, staff nurses and patient-relations representatives should make follow up calls to former patients
3	Doctor-oriented Processes	Reducing waiting time, prior knowledge on patients reports
4	Lack of Transparency	Humanise hospital signages, use language that patients can understand
5	Lack of Privacy	Information privacy, Medical records privacy
6	Indifference to Non-patient Customers	Taking care of patients relatives, dining services, prayer rooms
7	Inadequate Complaint Handling	Employee empowerment
8	Overworked Employees	Employee CRM

continued...

Sr No	Sins	Solutions
9	Poor Facilities / Design	Patient friendly and visitor friendly hospital
10	Poor Housekeeping	Clean and safe environment
11	Failure to Innovate	Innovative strategies

Source: Prof. Rene T. Domingo[4]

According to Stern (2011), for healthcare providers, the three key elements of CRM are: (i) gathering and managing database; (ii) analyzing the database to market to (in relation to patients, non-patient consumers, referring doctors and non-referring doctors); and (iii) identifying the return on investment from marketing campaigns. Gbadeyan (2010) has suggested customizations, interaction management and managing relations with patient as important components of CRM. To set up a successful CRM program organizations have to get: (a) staff support, (b) organizational involvement, and (c) customized CRM vendors for health care. There is also a need to address the human aspect of the implementation. Once CRM is implemented organizations can benefit immensely from the same. The main benefits of CRM also referred to as PRM are given in Table 5.

Table 5: Main benefits of PRM system for stakeholders and options to achieve the same

Benefits	With respect to	Options to achieve
Comprehension	Patient	1. Treatment Information 2. Self Awareness 3. Care Process
Communication	Patient and Staff	1. Feedback 2. Improved Communication Channels
Conceptualization	CRM	1. Improved at Department Level 2. Between Departments

continued...

Benefits	With respect to	Options to achieve
Collaboration	Organization	1. Management and Stakeholders
Collective Intelligence	Organization, Staff, Patients	1. Nurses "more prepared" 2. Concentrate work on patients in need for treatment

Source: Oinas-Kukkonen et al (2008)

A successful implementation of CRM requires an understanding of the expectations and needs of stakeholders involved. Feedback from patients should be taken. The hospital's management should continue to collect data about perceived service quality of outpatients on regular basis. This way they can keep track on perceived service quality of their hospital and continuously improve their service quality (Laohasirichaikul et al 2009).

Conclusions

i. All the three hospitals in Goa were not using PRM.
ii. If the three hospitals are compared it is seen that *Hospital C* which is a private hospital has performed better than the other two hospitals; the case study has shown that wherever / whenever elements of PRM were present, it was predominantly in the private hospital.
iii. PRM can help hospitals perform better by way of improving their service quality and by taking care of all the dimensions of CRM implementation.

Suggestions

a. Hospitals must use the principles of CRM to maintain relationship with patients.
b. Using CRM practices will help hospitals to take care of competition, profits and brand equity.
c. CRM should be practiced by everyone including the doctors;

staff should be equally involved in the planning process.

Limitation

Since the study findings are drawn on the basis of data pertaining to three hospitals in Goa, further research involving other hospitals will be required to draw generalizations for others.

Future Research

Future research can be done with other hospitals in Goa to find out if they are practicing CRM, and if yes, to what extent has it helped them to increase their business. Research can also be undertaken to see if CRM practices are limited to private hospitals in Goa. The same research areas can also be explored in other parts of the country and even abroad. Patient's perceptions and patient's view about the different hospitals is another area where research can be done. The research can be duplicated in other sectors like banking, automobiles, tourism etc.

NOTES

1. Reports of the finance commissions of India: First Finance Commission to the Twelfth Finance Commission: The Complete Report. India. Finance Commission. Academic Foundation. 2005. p. 268. Retrieved on 17/9/2015 http://fincomindia.nic.in/ShowContent.aspx?uid1=3&uid2=0&uid3=0&uid4=0&uid5=0&uid6=0&uid7=0
2. Retrieved from Directorate of Health Services: http://www.dhsgoa.gov.in/aboutus.htm
3. Retrieved from: http://www.navhindtimes.in/gmc-doctors-indulging-in-clinical-trials-on-patients/
4. Retrieved from: www.hospitalmanagementasia.com/wp.../A4%20Rene%20Domingo.pdf

REFERENCES

Almunawar, M. and Ansari M. (2011). Improving customer service in healthcare with CRM 2.0 Global Science and Technology Forum (GSTF) *Business Review*, 1(2).

Baker, L (2006). *Research methods, library trends*, University of Illinois 55(1):171–189.

Choi, K.S., Lee H., Kim C. and Lee, S. (2005). Service quality dimensions and patient satisfaction relationships in South Korean: Comparisons across gender, age, and types of service. *Journal of Services Marketing*, 19(3): 140–149.

Dasha, Saroj Kumar et al (2011). Managing customer relationships in private health care facilities: A study with reference to greater Noida city of Uttar Pradesh. *Serbian Journal of Management*, 6(1): 27–42.

Gbadeyan, R.A. (2010). Customer relationship management and hospital service quality in Nigeria. *An International Multi-Disciplinary Journal*, Ethiopia, 4(2): 168–184

Ghafari, P., Karjalian R. and Mashayekhnia A. (2011). Studying the relationship between different dimensions of CRM and innovation capabilities in Melli bank of Iran. *World Academy of Science, Engineering and Technology*, Vol. 5.

Gorman, G.E. and Clayton P. (2005). *Qualitative research for the information professional* (2nd ed.). London: Facet.

Grönroos C. (2004). The relationship marketing process: Communication, interaction, dialogue, value. *The Journal of Business and Industrial Marketing*, Vol. 19(2): 99–113

Handfield, R.B. and Bechtel C. (2002). The role of trust and relationship structure in improving supply chain responsiveness. *Industrial Marketing Management*, Vol. 31(4): 367–82.

Huang, H.C. and Chang C.W. (2008). Embedded ties and the acquisition of competitive advantage. *Journal of Intellectual Capital*, 9(1): 105–21.

Jobber, D. (2004). *Principles and practices of marketing.* [4th ed.] Berkshire, England: McGraw-Hill International, pp. 514.

Laohasirichaikul, B., Chaipoopirutana S. and Combs H. (2009). Effective customer relationship management of health care: A study of hospitals in Thailand. *Journal of Management and*

Marketing Research. 4(7): 1–12.

Mentzer, J.T., Min S. and Zacharia Z.G. (2000). The nature of interfirm partnering in supply chain management. *Journal of Retailing*, Vol.76(4): 549-68.

Oinas-Kukkonen, H., Räisänen T. and Hummastenniemi N. (2008) Patient relationship management. *Journal of healthcare Information Management*, 22(3).

Saiu K. (2003). Healthcare informatics. *inform Tech Biomed*, 7(1): 1–7.

Sheth J.N., Parvatiyar A. (1995). The evolution of relationship marketing. *International Business Review*, 4(4): 397–418.

Sin, L.Y.M., Tse, A.C.B. and Yim, F.H.K. (2005). CRM: Conceptualization and scale development. *European Journal of Marketing*, 39(11/12): 1264–90.

Stern. L. (2011). *How customer relationship management can help your hospital improve its bottom line and achieve its mission*. Retrieved from: http://www.beckershospitalreview.com/hospital-management-administration/how-customer-relationship-management-can-help-your-hospital-improve-its-bottom-line-and-achieve-its-mission.html

Yin, R. (1984). *Case study research*. Beverly Hills, CA: Sage Publications.

THE GLASS CEILING AND FACTORS INFLUENCING WOMEN'S CAREER ADVANCEMENT

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ABSTRACT

One of the most important decisions that young people have to make is the choice of a career. Career choice implies that individuals have gone through a decision-making process; that they have surveyed the work field, have assessed their competencies, have some understanding of what brings a sense of fulfillment and have examined alternatives and the likely effect of these alternatives on their self-concept. Choosing a career is, therefore, *a matching process*, where the person matches his/her personal needs with the field that best fits them. There are numerous reasons why students select a specific profession, with everyone being interested in making good decisions. Youth today aim high, and may often be disappointed when their expectations and aspirations are not met by the organization they choose to work in. More ladies are joining the workforce today. However, the presence of women in senior managerial positions is very low in spite of them having good academic record, much knowledge, quality and efficiency. This can be attributed to barriers such as prejudices and the *glass*

ceiling phenomenon. This often discourages women from joining the competitive workforce. This paper focuses on the *glass ceiling effect* or the *gender diversity* issue in government and private sector organizations in Goa, as well as on the factors which enable women advance in their careers. The opinion of males in the workforce regarding the latter, i.e., factors influencing women's career advancement prospects was also studied to find whether advanced education, work-home balance, workplace socializing, female attitude and demeanour and/or physical attributes, etc., were aspects that enabled women to move forward at their place of work.

Keywords: glass ceiling; organizational discrimination; occupational segregation; socializing factors; work-home balance

Introduction

India has a population in excess of one billion, with almost 500 million of them being women, half of whom are in the working age group. However, very few women reach the top in Indian organizations, and only two per cent of the total managerial strength in the Indian corporate sector comprises of women today. Historically, India has been a male-dominated society. Yet, in the past two decades or so, social change has opened the possibility for women to attain managerial roles in corporate India (Dunlop and Velkoff 2004). These non-traditional women managers are in the workforce in greater numbers than ever before, and their presence is predicted to rise. Yet their increased numbers have not been matched by a corresponding rise in their representation in senior levels of management. This phenomenon, referred to as the *glass ceiling*, presents a challenge to organizations (Morrison and Crabtree 1992).

The popular notion of *glass ceiling* implies that gender disadvantages are stronger at the top of the hierarchy than at lower levels and that these disadvantages become worse later in a person's career. According to the Federal Glass Ceiling Commission

1995, the concept *glass ceiling* refers to "artificial barriers to the advancement of women and minorities". These barriers reflect "discrimination", and the *glass ceiling* is the unseen, yet unbreachable barrier that keeps minorities and women from rising to the upper rungs of the corporate ladder, regardless of their qualifications or achievements (Cotter et al 2001). This study was carried out with the aim of determining whether the *glass ceiling* phenomenon is prevalent in the government and corporate sector in Goa.

Objectives

1. To establish if female employees in government and private organizations face any discrimination in their organizations in terms of occupational segregation to get to higher levels.
2. To find out the factors that enhance women's career advancement as reported by females.
3. To identify the reasons cited by males for promotion of female employees to higher positions.

Methodology

Sample and Sampling Method

The study involved 30 female and 30 male respondents, ranging in age from 26 to 51 years, chosen by purposive sampling. The respondents were residents of Panjim, Mapusa, and Margao, and were employed by organizations situated within a radius of 30 km from their place of residence. Half of the respondents within each group worked in government organizations in the capacity of teachers and administrators, while the other 30 were employed in the private sector, viz., banks, researchers in NGOs and the information technology industry. All of them held full-time, permanent jobs, with their total work experience ranging from 5 years to 32 years. A majority (83 percent) were in middle management positions while 17 percent were presently employed as managers. The exclusion criteria for the study included those who had just started out in their careers and those who were part-

time or contract workers. The marital status, level of education and period of their employment in their current organization is elaborated upon in Table 1.

Table 1: Demographic information of the respondents

PARAMETER	NUMBER
Marital status	
Single	24
Married with children	26
Married without children	10
Level of education	
Graduates	22
Post-Graduates	30
Doctorates	8
Period of employment with current organization	
5-10 years	38
11-15 years	8
16-20 years	14
Staff strength of the organization	
<100 employees	32
101-500 employees	14
>1000 employees	14

Source: Field work

Tool

A questionnaire approved and used by various organizations and researchers across the globe for determining the presence or absence of the *glass ceiling* effect in companies was used to obtain information required for the study. Apart from the demographic information, which was collected through the questionnaire, the questionnaire measured the stance of females regarding discriminatory attitudes. The questionnaire included a five point Likert scale for measuring the responses. The questionnaire included twenty statements, the responses for which could vary from '*strongly disagree*' to '*strongly agree*'. Both negative and positive statements were a part of the scale, and the scoring was reversed

accordingly. *Strongly agreeing* to a feeling of being discriminated at work had a score of one, *feeling no discrimination* at all, a score of five, and a *neutral response*, a score of three.

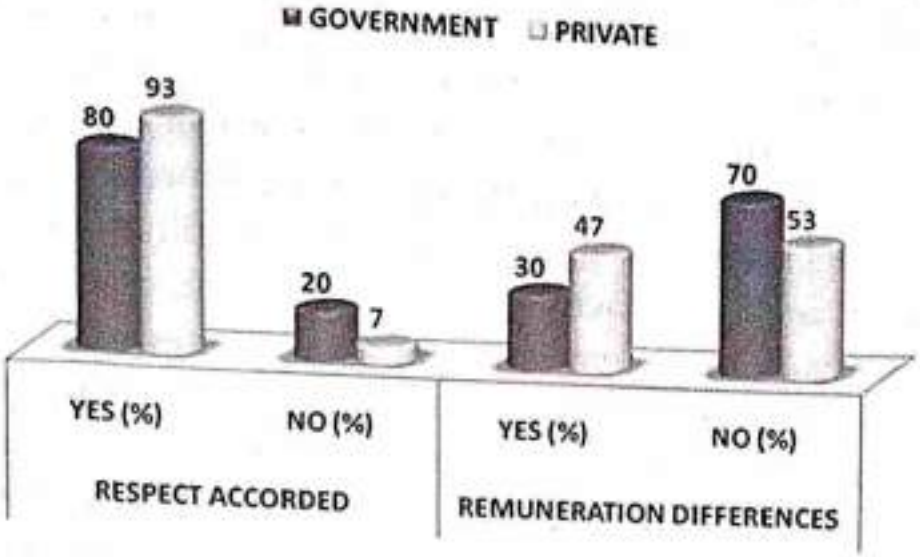
Data Analysis

Organizational Discrimination

Although women are now graduating in higher numbers than men from educational institutions (Fagenson and Jackson 1994) and more women are entering the paid workforce and taking up managerial roles (Parker and Fagenson 1994), the poor representation of women at senior management levels continues, due to the '*glass ceiling*' (Dimovski et al 2010). Organizational discrimination often prevents women from being promoted into upper management positions. In this study, twelve statements – pertaining to *respect accorded, differences in remuneration, occupational segregation, and whether females found equal opportunities to excel at their workplace* – were included to ascertain the existence of organizational discrimination at their place of work.

Women are, often, not only excluded from informal networks, but also from important meetings where decisions are made (Rosen et al 1989). Furthermore, women's ideas are frequently discounted or ignored, creating the '*invisible-woman syndrome*', and their actions are highly scrutinized and seen as a test case for women in the future. In this study, a majority of the respondents (70 percent) concurred that they were provided equal respect as the males in their organization, and stated that their opinions were valued over those of the males, when appropriate. A comparison of the responses received based on the nature of organization where they were employed revealed that a larger number of females employed in private organizations (93 percent) felt better respected than their government-employed counterparts (80 percent), thus suggesting the typical gender-bias that may exist in government organizations in India (Figure 1).

Figure 1: Organizational Discrimination at the Workplace

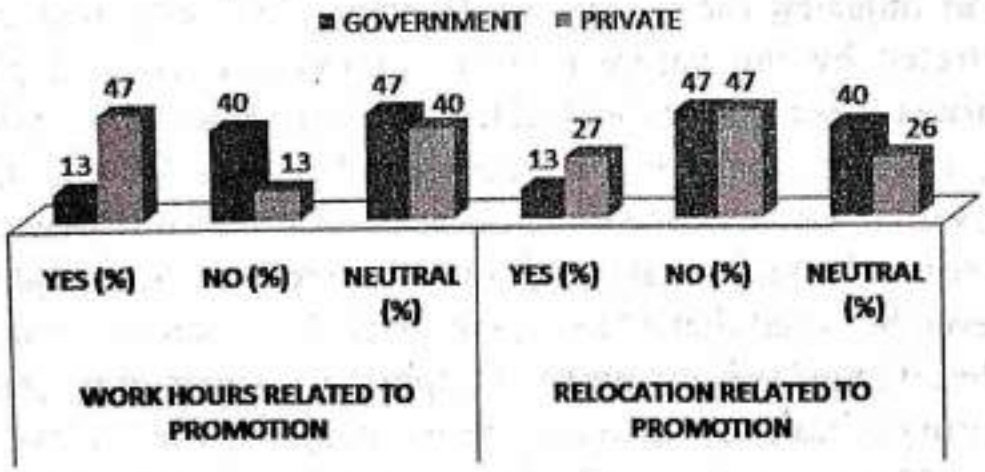


Eighty percent of the women in the study also felt that they did not have to perform better than their male counterparts to be promoted to the same position, thus opposing the concept of gender bias in industry, the percentage difference in results remaining unaffected by the nature of place of work. Encouragingly, a majority (83 percent) of the total females in the study also reported being rewarded for their performance rather than their gender at their workplace, negating the idea that a pay inequality may exist between males and females with the same credentials. It ought to, however, be noted that a lesser percentage (53 percent) of females employed in private organizations reported a gender-independent parity in pay scales compared to those employed in the government sector (70 percent) (Figure 1). This could be attributed to the fact that government salaries are often predetermined for a particular post, whilst private organizations have the liberty of varying pay scales depending on various factors.

Occupational segregation suggests that one gender is preferred over the other for certain jobs or tasks in an organization, with women expected to be overlooked for technical and managerial roles due to their presumed inability to cope with the demands of the job. Working beyond the standard work hours and accepting job transfers is one aspect of occupational segregation.

Forty per cent of the respondents opined that the longer hours spent at the workplace on a daily basis translated to an impression of being more career-oriented and a better employee, with an almost equal number (37 percent) offering a neutral answer to the question posed, thus suggesting that although they were not totally convinced about the direct relationship between time spent at work and chances of promotion, they were still unsure about whether it could be a factor of the *glass ceiling* in organizations. As expected, when a comparison of the responses received was attempted based on the nature of organization, it revealed that a larger percentage of the females working in private organizations (47 percent) correlated longer hours of work to dedication at the workplace compared to those employed in government bodies (13 percent) (Figure 2).

Figure 2: Occupational Segregation at the Workplace



Although a big number of 47 percent of the respondents stated that promotions based on geographical relocation for job-related reasons did not exist in their current place of employment, a fair number (40 percent and 26 percent; government and private employees, respectively) were not absolutely certain about this being a factor for non-promotion at their place of work. The difference in responses remained similar when comparisons were made for the nature of organization (Figure 2).

When queried as to whether the work abilities of women and

men were the same, all respondents replied in the affirmative, thus emphasizing their firm belief that gender bias in terms of work expectations should not exist in organizations. A majority of the total study sample further felt that women need not perform better than males in order to attain promotions at their workplace, although opinion was divided as to whether standards were higher for women than for men in their current place of work (Table 1). A majority of females working in private organizations were unsure (47 percent) whether their companies expected 'more' from them as compared to their male counterparts, thus indicating disparity in what people 'believe' and what 'actually happens' (Table 2).

Table 2: Beliefs and Standards regarding Work Performance of Females

Nature of Organization	Women must perform better than men to be promoted		Standards are higher for women than for men		
	Yes (%)	No (%)	Yes (%)	No (%)	Neutral (%)
Government	40	60	20	53	27
Private	33	67	20	33	47

Source: Field work

Factors influencing career advancement of women

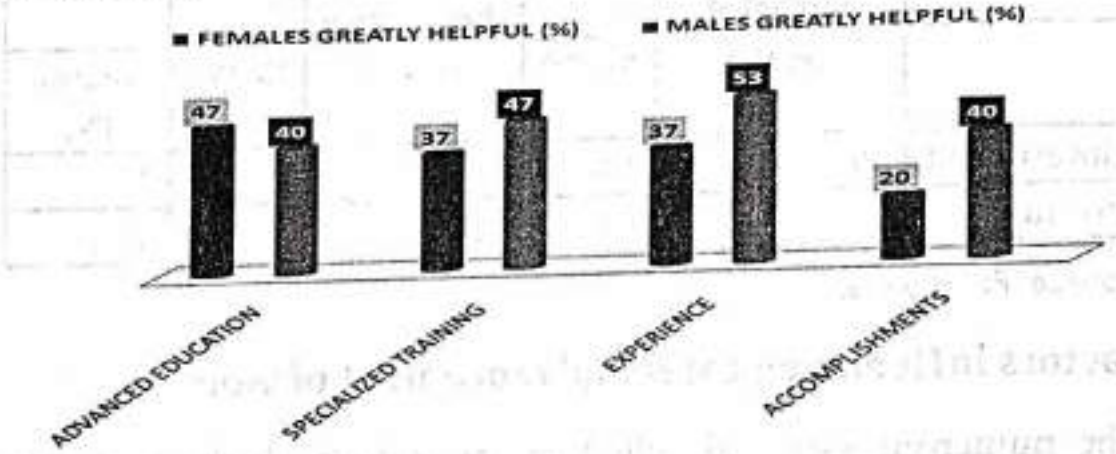
The numerous essentials cited by most individuals as much-required to secure promotions at their place of work can be grouped under six factors:

- *Professional Factors*
- *Gender-Related Factors*
- *Work-Related Factors*
- *Socializing Factors*
- *Behavioural Factors*
- *Work-Home Balance Factors*

The study subjects – both males and females – were queried as to the influence of each of the above factors on the career advancement prospects with respect to the females in their organization, the results of which are discussed herewith. No differences in opinions based on nature of work place (government and private) were observed when each of the factors was considered.

A] Professional Factors: *Advanced education, specialized training, variety of experience,* and *proven record of accomplishments* are cited as professional reasons that can attract promotion for employees in an organization. In this study, both males and females believed that *advanced education* was important in helping enhance one's career (Figure 3). However, the males opined that more than education, '*experience*' and '*specialized training*' were vital in determining whether ladies got forward in position at their place of work .

Figure 3: Professional Factors influencing Career Advancement of Women

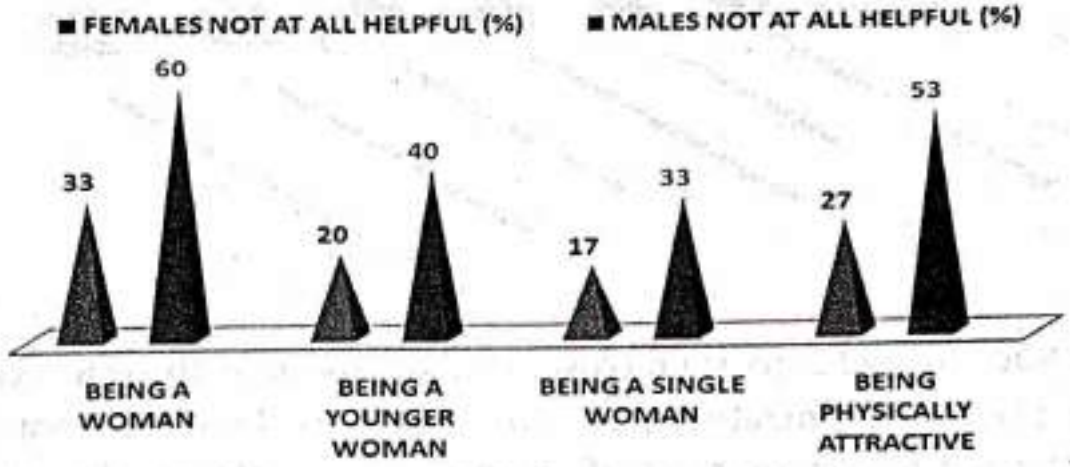


B] Gender-Related Factors: Individuals often believe that the gender of a person may sometimes influence promotions at the workplace, with women occasionally being given advancement in their career to prove the unbiased nature of the organization. Among the gender-related factors considered in this study as a reason for promotion were being a woman, *being a younger woman, being a single woman, and being physically attractive.*

It was encouraging to note that a greater percentage of males did not feel that these gender-related variables were important for

women to receive promotions at their place of work (Figure 4), thus indicating their perception that men and women are treated on an equal footing in their organizations. However, the females in the study opined that being *'younger, single, or physically attractive'* could help members of their gender get quicker promotions (Figure 4), thereby indicating the diametrically opposite view of the genders on this aspect of career advancement of females.

Figure 4: Gender-Related Factors influencing Career Advancement of Women

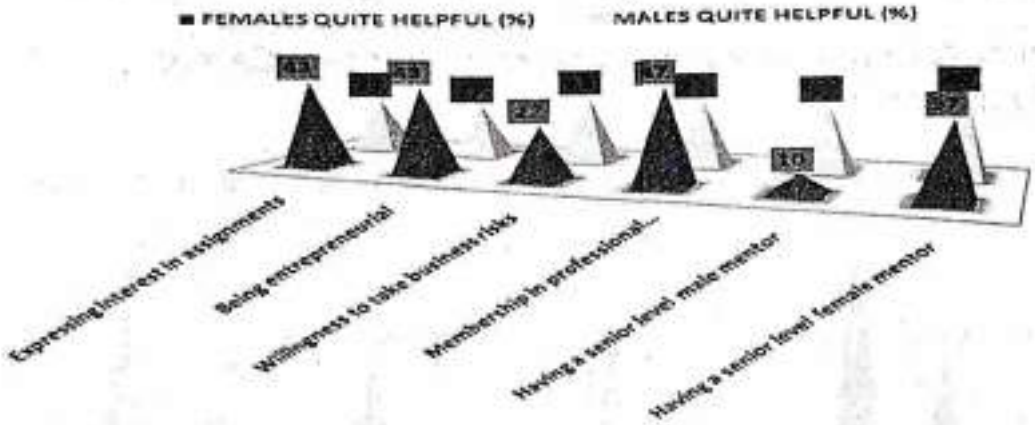


C] Work-Related Factors: Promotions at the workplace are expected to follow the style of working and the dedication of employees in an organization. *Expressing interest in challenging and visible assignments, being entrepreneurial and taking initiatives, willingness to take business risks, membership in professional organizations, having a senior level male mentor in the organization,* and *having a senior level female mentor in the organization* were the factors chosen for query in this study to understand the influence of an individual's work habits and her advancement in career at the workplace.

A greater percentage of females in the study rated *'expressing interest in challenging assignments'*, *'being entrepreneurial'*, and *'membership in professional organizations'* as important for career growth as opposed to the males in the study who rated *'having a senior level female or male mentor'* and the *'willingness to take business risks'* as more important for their female colleagues

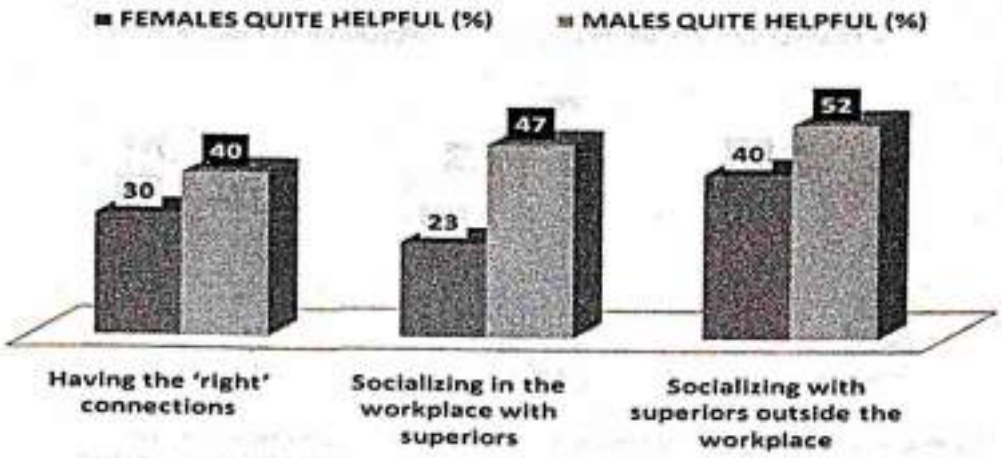
to advance in their careers (Figure 5). This suggests that males consider 'influence' and a male-driven risk-taking behavior (instead of a cautious approach) as possibly being necessary for the career advancement of females.

Figure 5: Work-Related Factors influencing Career Advancement of Women



D] Socializing Factors: Employees today, especially those working in private organizations, believe that work hours cannot be restricted to the confines of an office space. *Having the 'right' connections, socializing in the workplace with superiors and influential individuals,* and *socializing with superiors* and *influential individuals outside the workplace* are sometimes considered important to receive promotions in one's career. As expected, a greater percentage of the males felt that their female counterparts ought to socialize more in order to receive promotions (Figure 6) with more than half the males believing that socializing outside the workplace was vital in being considered for a promotion. Surprisingly, a significant percentage of females in this study also supported the latter opinion of the males (Figure 6), indicating the changing view of today's employed females.

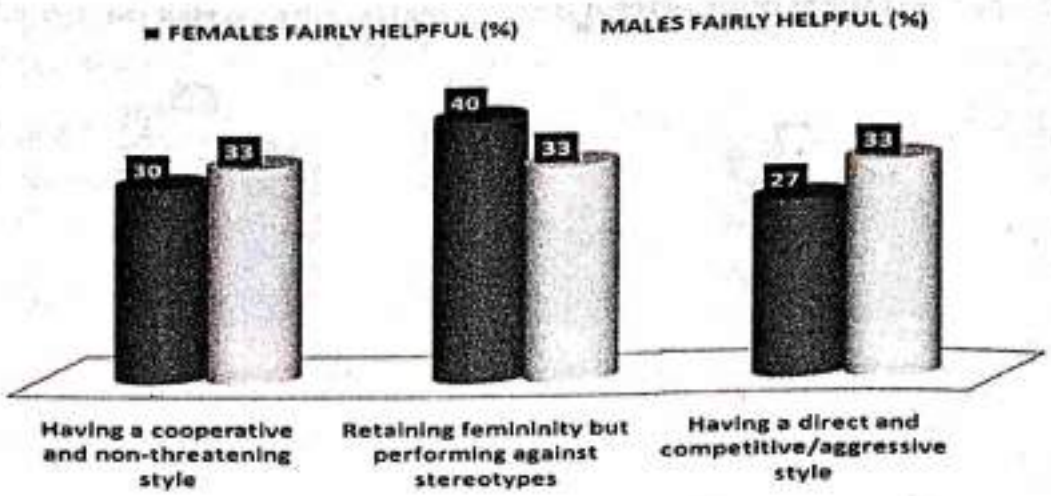
Figure 6: Socializing Factors influencing Career Advancement of Women



E] Behavioural Factors: The behaviour of an individual is known to influence relationships at the workplace as also the working environment and atmosphere. Behavioural factors such as *having a cooperative and non-threatening style, retaining femininity but performing against stereotypes,* and *having a direct* and *competitive/ aggressive style* were considered as influential factors for career advancement in this study.

It was observed that almost equal numbers of each gender had similar views as to the 'right' behaviour that female employees ought to exhibit in order to receive quicker promotions, i.e., *behaving like a lady with the right balance of cooperation & aggression* (Figure 7), thus dispelling the notion that adamant and aggressive behaviour begets promotions.

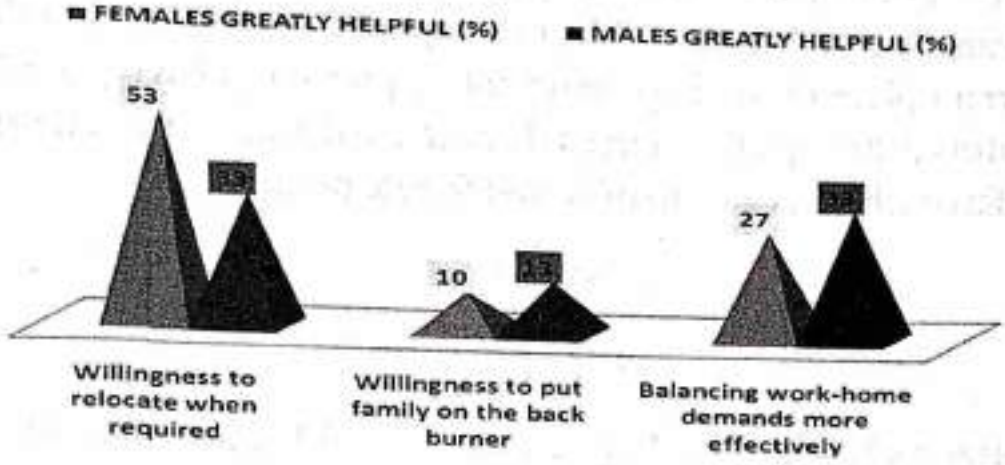
Figure 7: Behavioural Factors influencing Career Advancement of Women



F] Work-Home Balance Factors: Women, and men too, often believe that the former lose out on promotions at the workplace due to family ties and responsibilities which prevent them from taking up more challenging roles that require either more working hours or relocations. The work-home balance factors that were considered in this study were *willingness to relocate when required, willingness to put family on the back burner and devoting all attention to career, and balancing work-home demands more effectively.*

Figure 8 indicates that a greater percentage of females considered '*non-willingness to relocate*' as a stumbling block in their path of career advancement while males considered a combination of '*non-willingness to relocate*' and '*inability to balance work-home demands more effectively*' as barriers to promotions of their female colleagues at their place of work. These results accentuate the burden on females to prove themselves both at home and their place of work.

Figure 8: Work-Home Balance Factors influencing Career Advancement of Women



Conclusion

In the 21st century, women are leaders in industry, government and organizations worldwide. Much progress has been made for women's advancement, with yet more to be achieved (Lockwood 2004). However, studies have indicated the existence of a *glass ceiling* in organizations (Dimovski et al 2010) – a colourful phrase used to describe what we already know as gender or racial inequality (Cotter et al 2001) – that prevents women from reaching the zenith of their careers despite their inherent qualifications and abilities. This study attempted to study the existence of the glass ceiling in government and private organizations in Goa by eliciting the views of male and female employees regarding their environment at work.

As expected, individuals in the study, irrespective of gender, felt that the *'hours spent at work'* is the foundation for promotions. While females cited *'education'*, *their 'gender'*, *'being entrepreneurial'*, *'retaining femininity while being aggressive'*, and *'willingness to relocate'* as important factors for attaining promotions in their workplace, the males in the study cited *'training & experience'*, *'having male & female mentors in the organization'*, *'ability & willingness to socialize within and outside the workplace'*, *'retaining femininity while being aggressive'*, and *'ability to balance work & home'* as significant factors for their female counterparts to receive

promotions. The only factor that males and females agreed upon was *'retaining femininity while being aggressive'* as important for career advancement. Appreciatively, the respondents did not view their current place of work (government or private) as having a 'Glass Ceiling', although they agreed that certain defining characteristics differed when it came to male and female promotions.

REFERENCES

Cotter, D.A., Hermsen J.M., Ovadia S., and Vanneman R. (2001). The glass ceiling effect. Social Forces. December, 80(2): 655–682.

Dimovski, V., Skerlavaj M., and Man M.M.K. (2010). Is there a 'glass ceiling' for female managers in Singapore organizations? *Management*. Vol. 5: 307–329.

Dunlop, J.E. and Velkoff V.A. (2004). *Women and the economy in India*. International Programs Center. Washington, D.C., Bureau of the Census, January; pp 7.

Fagenson, E.A., and Jackson J. (1994). The status of women managers in the United States. In N. J. Adler and D. N. Izraeli (Eds.) *Competitive frontiers: Women managers in a global economy*, pp 388–404. Cambridge: Blackwell Publications.

Lockwood, N. (2004). The glass ceiling: Domestic and international perspectives. *SHRM Research Quarterly*, 2: 1–11.

Morrison, A.M., and Crabtree K.M. (1992). *Developing diversity in organizations: A digest of selected literature*. pp 7-29. Greensboro, NC: Center for Creative Leadership.

Parker, B. and Fagenson E.A. (1994). An introductory overview of woman in corporate management. In M.J. Davidson and R.J. Burke (Eds.), *Women in Management: Current Research Issues*; pp 11–28. London: Chapman Publications.

Rosen, B., Miguel M., and Peirce E. (1989). Stemming the exodus of women managers. *Human Resource Management*, 28(4): 475–492.

INCLUSION OF INDIGENOUS FOOD IN MANAGEMENT OF UNDER-NUTRITION IN CHILDREN BELOW SIX YEARS OF AGE

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ABSTRACT

Under-nutrition is a problem in many developing countries, most commonly affecting children between the age group of 6 months to 6 years. Chronic under-nutrition has many short-term and long-term physical and mental effects such as growth retardation, lowered resistance to infection and increased mortality rates in young children, thus it is imperative that under-nutrition should be treated as a serious issue. Indigenous under-utilized foods, long recognized for its potential benefits, can be used to alleviate under-nutrition and can immensely contribute towards meeting nutritional demands. Findings of the present study on inclusion of indigenous food in management of under-nutrition below six years age children revealed that 30 percent children were suffering from malnutrition with 22 percent being moderately underweight and 10 percent with severe under-nutrition. Parents of 59 percent children had no formal education. Annual family income of 85 percent children was <Rs.8000/month and 60 percent children belonged to a small family size (n≤4). Inadequate knowledge, illiteracy, faulty dietary habits and low socioeconomic status

were some factors responsible for under-nutrition in children. Average intake of energy and nutrients was low when compared to recommended dietary allowance given by ICMR. While only 15 percent of the children had consumed breadfruit, 20 percent had other local vegetables in their diet occasionally. Awareness was created about the inclusion of breadfruit, kulith, indigenous leafy vegetables and demonstration of representative indigenous recipes to children/mothers. Non significant improvement in weight gain was seen in 15 percent of the undernourished children.

Keywords: dietary habits; indigenous; mortality; underutilized; under-nutrition

Introduction

Malnutrition, either under-nutrition or over-nutrition is defined as a pathological condition of varying degrees of severity and diverse clinical manifestations, resulting from deficient assimilation of the components of the nutrient complex (Arnold et al 1998). Under-nutrition is a major public health problem worldwide, particularly in developing countries (Salve et al 2010). Under-nutrition impairs physical, mental and behavioural development of millions of children and is a major cause of child mortality (Tomkins 2001). It is a factor in an estimated 54 percent of all childhood deaths, globally (Gopalan et al 2004). As recently as 2010, 10.5 million children died, each year, in India due to malnutrition and about 2.5 million of these were < 6 years of age (Claeson et al 2000). Malnutrition may manifest as delayed or stunted growth. To evaluate nutritional status, assessors can use measure of body composition and development (anthropometric measurements) or measures of how well the body performs certain tasks (functional tests of nutrition status). Anthropometric measurements and functional tests useful in nutritional assessment indicate that each measurement depends on adequate nutrition. The most powerful tool in growth assessment is the World Health Organization (WHO) weight for age (WFA) growth standards and a very effective

and recognised method (World Bank 1996; American Academy of Pediatrics 2004). Malnutrition is also associated with mothers' education, awareness, weaning of the child, income of the family and family size (Pelletier et al 1995). Exclusive breast feeding till 6 months and thereafter till the age of 2 years with adequate weaning is of prime importance. Increasing fruit and vegetable consumption is an important health behaviour. Parental and other psychosocial influences on children's fruit and vegetable consumption are poorly understood. Many traditional vegetables and underutilized legume crops are an essential source of vitamins, micronutrients and protein and thus a valuable component to attain nutritional security (Rice et al 2000; Salve et al 2010). Experiments with home gardens in India including about two dozen vegetable species have shown that a small area of 6 m × 6 m can provide much of the vitamin A and C requirement for a family of four during the entire year (Swapna et al 1996). Apart from the provision of essential vitamins, many of the vegetable crops included in home garden kits are known to be naturally nutrient-dense (ICMR 2010). Nutrition education on dietary management especially using indigenous nutrient dense foods like pulses, fruits and vegetables could prove beneficial in reducing the incidence and controlling the under-nutrition and associated deficiency diseases (Nazrin 2012).

This study was undertaken to impart nutrition education to mothers on inclusion of indigenous foods in prevention and management of malnutrition in children; assess prevalence and degree of malnutrition in selected children; determine food intake of children; and demonstrate indigenous food based recipes to Mothers and Anganwadi workers so as to incorporate them in daily diet and hot cooked meal respectively of the children.

Material and Method

Duration of Study: The study was carried out over a period of 10 months in phased manner. Phase I dealt with dietary and anthropometric assessment; phase II involved demonstration of recipes using indigenous food and nutritional intervention to mothers and children; phase III was a follow-up.

Children: Hundred rural Goan Children of 3–6 years age receiving Hot Cooked Meal (HCM) in 15 Anganwadi centres (AWCs) of Tiswadi taluka of North Goa District were randomly selected. The mothers of these children were also included in the study.

Dietary assessment: A three days 24 hour dietary recall method was used to determine the food intake of children using an oral questionnaire. Mothers and children were both interviewed and asked to recall what and how much the child ate and drank over the past three days. From the amount of each item consumed by the children in different age groups, the mean intake of food was calculated. Average nutrient intake of protein, energy, calcium, iron, fat and Vitamin A were calculated using food composition tables of ICMR (1991), and then compared with Recommended Dietary Allowances (RDA) for their adequacy.

Anthropometric assessment: Weight was taken as a measure of overall nutritional status together with age, sex, and height/ length. Weight of a child using light clothing was measured to the nearest 0.1 kg using a bathroom weighing scale. Nutritional status of children was assessed by referring to WHO 2006 growth charts based on Standard Deviation (SD) and Weight-for-Age (WFA) classification. Malnutrition was classified as moderate and severe if WFA was <2SD and <3SD respectively (in De Onis et al 2007).

Knowledge: In order to plan nutrition education, knowledge of mothers on nutrients present in food was determined by administering a closed-ended questionnaire comprising of 100 multiple choice questions and assigning a score. A score of 50 was considered as average and indicative of having sufficient knowledge on nutritional aspects. Series of Nutrition Education (NED) activities were organized on a weekly basis to create awareness on indigenous foods for 6 months. The sessions were planned with clear defined objectives. Increase in level of knowledge was seen as an improvement in average score of 50 and above.

Demonstration: Recipes were demonstrated using indigenous vegetables collected from the vicinity. The acceptability of recipes was determined by scoring the response of 10 children and 10

mothers using the 9 point facial and verbal hedonic rating scale respectively.

Results and Discussion

Target Group

A total of 100 children were selected of which 60 were girls and 40 boys. Parents of 59 percent children had no formal education, 62 percent mothers and 68 percent fathers had education till grade 10 or less and only 8 percent mothers and 12 percent fathers were graduates. Fifteen percent of children's annual family income was more than 8000 whereas 60 percent children's family income was less than 5000 and 35 percent children belonged to large family size. As recorded in Table 1, the children from the target group could be conclusively classified based on income and size of family. In earlier studies, families with low socio-economic status with monthly income of Rs. 2000 or less, had 52.2 percent malnourished children, while the families with an income of Rs. 5000 and more, had 24.7 percent malnourished children (see Patwari et al 1999 and Pelletier et al 1994). According to National Sample Survey Organisation 2008,[1] 20 percent people in rural India earn only Rs. 12 a day, of which each person spent just Rs. 7 on food. In Orissa and Chhattisgarh, 44 percent people suffered from such a devastating situation. The survey says life is a shade better in urban India where 22 percent people spend Rs. 19 daily. In urban Bihar, 56 percent live on this amount, thus people migrate from villages to cities. According to various studies, families with one child have 29.8 percent risk of child malnutrition, while families having 4 or more children had 52.9 percent risk. With increasing family size, the nutritional status of the children as well as the mother goes down as reported in various studies (see Claeson et al 2000).

Table 1: Socio-economic status of children in the target group

Family size (N=100)	Percentage	Annual family income	Percentage
Small(1-4 members)	33	<3000	25
Medium(5-8 members)	32	<5000	60
Large(≥9 members)	35	≥8000	15

Source: Fieldwork of Authors.

Feeding Pattern in Target Children

WHO recommends exclusive breast feeding for 6 months which would have its influence on determining nutritional status of children in their subsequent period of life. Findings in the present study revealed that only 33 percent of the target children of the study were exclusively breastfed for 6 months (Table 2).

Table 2: Feeding pattern in target children during the first two years of their life (%)

Duration of Feeding	Bottle feeding (%) N=100	Breast feeding (%) N=100	Reason
Exclusive (6 months)	-	33	
24 months	70	28	Inadequate milk, lack of time, etc.
>12 months		23	
<3 months		23*	Lactation failure, work demand
1 month		19*	-do-

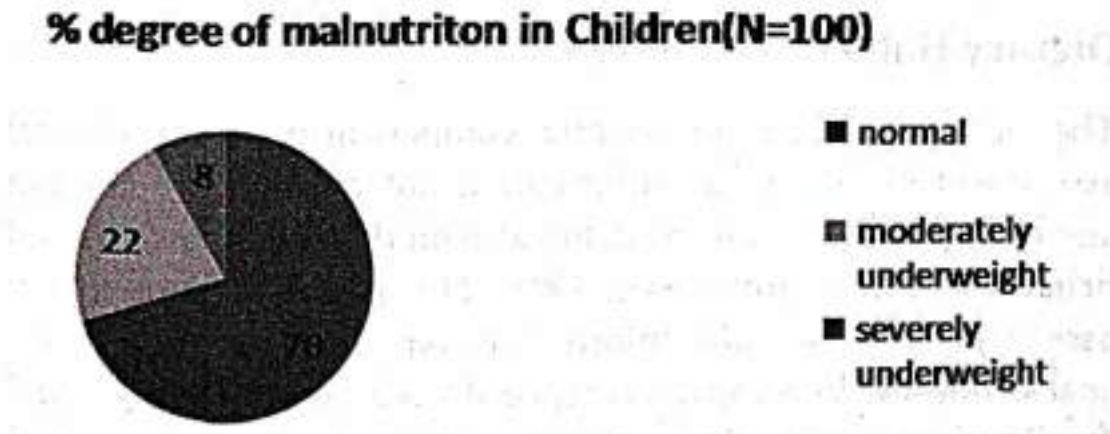
*Resorted to bottle feeding till 24months
Source: Fieldwork of Authors.

Growth is an important indicator of health and nutritional status of a child and a variety of growth charts are currently available to help with the assessment of growth such as WHO growth charts. Growth measurements were performed at regular intervals in

order to identify children at-risk and to monitor a child's clinical response to nutritional therapy as per recommendations of WHO (1986) standards. From the target group 22 percent children suffered from moderate under-nutrition (MU) with <2SD of WFA (Fig. 1); these were the ones who were not exclusively breastfed and had delayed weaning. Nazrin (2012) reported that most children grow normally till about fourth or sixth month during which period they are fed almost exclusively on breast milk. Growth retardation sets in thereafter and reflects the cumulative effects of dietary inadequacy and frequent episodes of infections. The MU was seen in 8 percent of the children for last 5 months; these also had episodes of diarrhea and fever on several occasions. Children who received no breast feeding had a high frequency of malnutrition, which according to one study was estimated to be almost 39 percent (American Academy of Pediatrics 2004; Khan 1993).

The findings of the present study are similar to the overall estimates of national prevalence of malnutrition in India (Khan 1993; Patwari et al 1999) in which diarrhea and viral fever was found to be the cause of under-nutrition in children with at least one episode of acute diarrhoea and at least one case of acute respiratory infection.

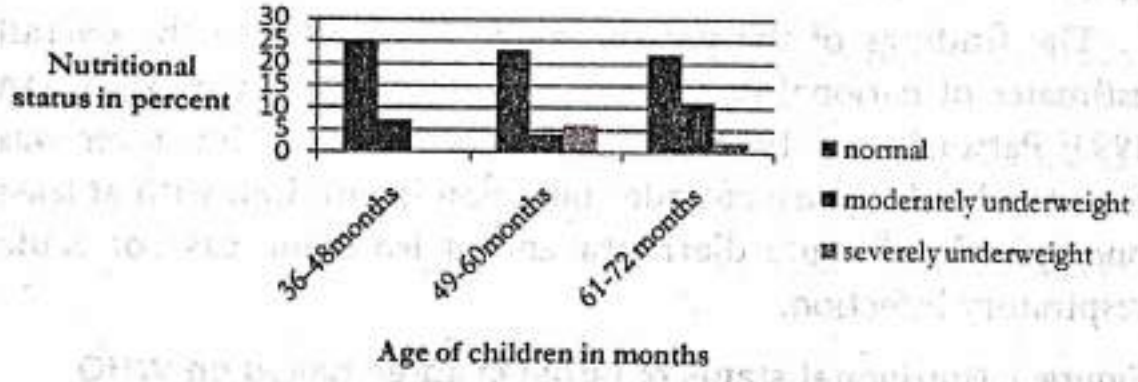
Figure 1: Nutritional status of target children based on WHO growth standards



Source: Fieldwork of Authors.

The age-wise distribution of under-nutrition in target children shown in Figure 2 corroborates with age-wise severity of malnutrition reported previously by Pelletier et al (1994) and American Academy of Pediatrics (2004). Lack of severe form of malnutrition observed in 3–4 year old children is possibly due to mothers' vigorous involvement in feeding programme of the child. The moderately underweight and severely underweight recorded in age group of school going children may be because once the child starts going to school the attention of the parents is diverted to their school work and food becomes a secondary matter. According to Gomez et al (1952) and Mehrotra et al (2011) growth retardation sets in schooling children because nutritional needs of the children are often over looked.

Figure 2: Age wise distribution of under-nutrition in children (N=100)



Source: Fieldwork of Authors.

Dietary Habits of Children

The dietary history is an essential component of the nutritional assessment as it provides information not only on the amount and quality of food consumed, but also on the eating patterns and behaviors of the family (Khan 1993). This part of the nutritional assessment also provides information on the number of meals, snacks and beverages consumed; special foods eaten by the child and family; vitamin and mineral supplements ingested regularly; food allergies; intolerances and unusual feeding behaviors (Mehrotra et

al 2011). Food-related factors may affect dietary intake and include food allergies, intolerances, self-imposed and/or prescribed diets and feeding skills (Nazrin et al 2012).

Only 15 percent of the children in the present study had eaten breadfruit which is a potential source of nutrients. Drumstick leaves and kulith (a pulse) were not consumed by all the children, whereas consumption of other local vegetables was seen in only 20 percent of children. Ninety six percent of the mothers reported that their children had dislike towards the local vegetables, however it was found that all these mothers had not introduced these vegetables in their children's diet at an early age and was included only once or twice which could be the reason for children not acquiring a taste for these vegetables. Most frequently consumed vegetables were potatoes, cabbage, tomatoes and cauliflower whereas red gram dal and moong were the preferred pulses. The HCM at the AWC was chiefly based on cereal pulse combination with value addition by gingelly seeds, soyabean and groundnut powder.

A 24-hour recall method was used to determine the intake of essential nutrients in children. As the RDA differs based on the age group of children, nutrient intake was accordingly considered. The percentage deficiency of five major nutrients and energy is given in Table 3. The table illustrates that children in the age group of 4–6yrs were 22.39 percent and in 1–3 years age group were 16.18 percent deficit in protein intake when compared to RDA (20.1g/ day and 16.7g/d respectively). This probably could be the reason for more percent of malnourished children in 4–6 years of age group. The average consumption of Fat by 1-3 years and 4–6 years children was 21g and 18g/day respectively who also had low Vitamin A intake which is a fat soluble vitamin. Calcium is an important nutrient for growing children and is required for the building and growth of stature. However, 33.33 per cent deficit of calcium was seen in 4-6 yr old children with 26.6 percent deficit of iron in 1-3years old children. An energy deficit of 13 percent and 24 percent in 1–3 years old and 4–6 years old children respectively, was determined which could have a faltering effect on the growth in the future, causing malnutrition, thus constant dietary supervision should

be mandatory in children. Inclusion of all the food groups with inexpensive indigenous sources in adequate amounts would help to deal with malnutrition.

Table 3: Average daily nutrient intake of target children

Nutrient	RDA		Percent deficit		Average intake	
	1-3yrs	4-6yrs	1-3yrs	4-6yrs	1-3yrs	4-6yrs
Energy(Kcal)	1060	1350	13.0	24.0	920	1020
Protein(g/day)	16.7	20.1	16.18	22.39	14.0	15.6
Fat (g/day)	27.0	25.0	22.22	26.80	21.0	18.3
Calcium (mg/day)	600	600	10.67	33.33	536	400
Iron (mg/day)	9	13	26.66	21.54	6.6	10.2
Vitamin A (mg/day)	400	400	21.0	25.42	316	298.3

RDA=Recommended Dietary Allowance by ICMR, 2010
Source: Fieldwork of Authors.

Nutrition Knowledge among the Mothers

Indigenous vegetables and other food sources like pulses/millets can make an important contribution to the diet as they are rich sources of micronutrients including provitamin A (ICMR 2010). Intervention has proved effective in improving the Vitamin A status in deficient population; and reduced mortality by up to 23 percent in infants and children between the ages of 6 months and 5 years (Tomkins 2001; Wardle and Parmenter 2000). Unfortunately, many people are not aware of the nutritional value of such foods and may regard them as inferior for the purpose of use.

Interestingly, importance of adequate nutrition was known to all the mothers of target children, due to awareness activities by the Anganwadi workers. Mothers had an average knowledge on the nutrient composition of the foods; however 60 percent of mothers had very good knowledge of Vitamin A rich yellow orange fruit and vegetables as sources but a poor knowledge on green

leafy vegetables and animal food sources. Nutritional analysis of indigenous vegetables like drumstick, red and white amaranth, pumpkin leaves, breadfruit, colocasia and pulses like ragi, kulith, etc. indicate that they are good sources of calcium, magnesium, iron, potassium, zinc, Vitamin C and carotene as compared with spinach and cabbage and other pulses. Most plants are good sources of calcium, ranging from 200 mg to300 mg per 100 g (Gopalan et al 2004).

Table 4: Knowledge of target children mothers on food sources and their nutrient value (%)

Nutrients	Knowledge aspects in % of mothers (N=100)					
	Nutrient deficiencies		Food sources		Functions	
	Before	After	Before	After	Before	After
Iodine	14	80	60	100	46	95
Vitamin A	60	100	60	100	66	100
Iron	34	90	40	95	47	96
Vitamin C	26	88	56	95	34	98
Protein	32	92	67	100	59	94

Source: Fieldwork of Authors.

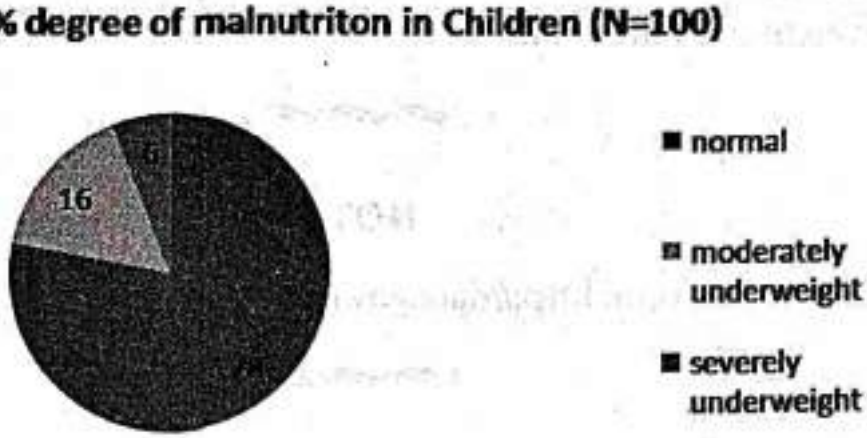
Iodised salt was found to be consumed by 80 percent of the families however with faulty method of its storage and were aware of iodized salt as the only source of iodine. Sixty six percent of the mothers had knowledge on important functions of Vitamin A compared to other nutrients. The findings revealed that frequent sensitization on nutritional aspects can increase the level of knowledge as seen in post awareness findings which indicated significant ($p<0.05$) increase in knowledge in mothers. Improvement in dietary habits of children was also reported by mothers and the anganwadi workers on follow up. Mehrohtra et al (2011) in a study reported that nutrition education can induce desirable behavioural changes for ultimate improvement in nutritional status.

Sensory Evaluation and Effect of Indigenous Food on Nutritional Status

Studies have reported that major barriers to eating more fruits, vegetables, and dairy products and eating fewer high-fat foods included a lack of sense of urgency about personal health in relation to other concerns, and taste preferences for other foods. Suggestions for helping adolescents eat a more healthful diet include making healthful food taste and look better, limiting the availability of unhealthful options, making healthful food more available and convenient, teaching children good eating habits at an early age, and changing social norms to make it "cool" to eat healthfully (Tomkins 2001).

Recipes like sweet kuleeth porridge, bhajias with kuleeth flour and drumstick leaves, breadfruit pakodas with mixed pulse batter, boiled breadfruit pancakes and papads to be deep fried were standardized. Breadfruit is reported to have high level of carbohydrates with 2.3 percent protein, 2.6 percent fat, 30 mg percent calcium and iron content of 2.4 mg percent (Gopalan et al 2004). Drumstick leaf powder by drying at room temperature for 3–4 hours followed by hot air oven drying was also developed to be used in HCM at the AWC. All the products were organo leptically accepted by the panel of judges. The HCM at AWC were best acceptable at 3 percent level of incorporation of drumstick leaf powder with respective scores for overall acceptability ranging from 5.90±0.87. An increase in frequency of preparation and consumption of these products was observed in mothers and children on demonstration and nutrition education. The AWW's also reported increased demand placed by children for the developed food products. Improvement in nutritional status was seen in 15 percent of the children after 8 months on strict inclusion (self reported) of balanced diet with incorporation of indigenous foods (Figure 3).

Figure. 3: Nutritional status of target children post nutrition intervention



Source: Fieldwork of Authors.

Recommendations

Nations where the human resource is undervalued and material resources are overvalued always remain poor. India stands 25th on the Global Hunger Index with 46 percent of underweight children below 5 years of age (Pelletier et al 1995). Hence policy makers and nutrition experts need to work on effective strategy for promoting low cost nutritious foods and good health. Thus it is recommended to:

- Promote exclusive breast feeding for 6 months
- Introduce timely weaning foods using indigenous nutrient rich foods
- Organize continuous Nutrition and Health Education activities by experts to enable consumers to make a better food choice so as to prevent and manage under-nutrition.

Conclusion

The percentage of malnutrition in children under six years age is quite high especially in rural area due to multiple factors as reported in numerous studies. Lack of formal education and awareness, late weaning, lack of breast feeding and low purchasing power were some of the factors associated with malnutrition in

children. Combination of these factors predisposes the children to various infections. Inclusion of underutilized low cost indigenous foods can be one definite sustainable approach in reducing the prevalent malnutrition.

NOTE

1. Retrieved from: http://data.gov.in/dataset-group-name/national

REFERENCES

American Academy of Pediatrics (Committee on Nutrition) (2004). In Kleinman R, edited. Pediatric Nutrition Handbook. 5th ed. Chicago: American Academy of Pediatrics, 23–54.

Arnold F., Choe M. K, Roy T. K. (1998). Preference; The family-building process and child mortality in India. Popul Stud; 52:302–15.

Claeson M., Bos E.R., Mawji T., Pathmanathan I. (2000). Reducing child mortality in India in the new millennium. Bull World Health Organ.; 78(10):1192–9.

De Onis, M., Garza C, Onyango AW, et al (2007). Comparison of the WHO child growth standards and the CDC 2000 growth charts. J Nutr. 137: 144–8.

Gopalan, C., Ramasastri B.V. and Pant K.C. (2004). Tables of food composition: Nutritive value of Indian foods, National Institute of Nutrition Press, ICMR, Hyderabad, pp 40–73.

Gomez, F., Ramos G.R., Cvavito I. (1952). Nutritional recovery syndrome. Pediatrics, 10: 513–7.

ICMR (2010). Nutrient requirement and RDA for Indians. Hyderabad, National Institute of Nutrition, p. 83.

Khan, M.E. (1993). Cultural determinants of infant mortality in India. J Fam Welfare, 39(2): 3–13.

Mehrohtra, M., Arora S., and Nagar V. (2011). Nutritional health status of primary school children - A study in Bareilly District. Indian Educational Review, 48: 19–29.

Nazrin, A. (2012). Dietary practices and nutritional status of pre–school children of Sivasagar, Assam. International Journal of Computer Applications in Engineering Sciences, 2: 266–270.

Patwari, A.K. (1999). Diarrhoea and malnutrition interaction. Indian J. Pediatr.; 66(1 Suppl): S124–34.

Pelletier D.L., Frongillo E.A., Schroeder D.G, Habicht J.P. (1994). A methodology for estimating the contribution of malnutrition to child mortality in developing countries. J Nutr., 124:2106S–2122S.

Pelletier D.L., Frongillo E.A., Schroeder D.G., Habicht J.P. (1995) The effects of malnutrition on child mortality in developing countries. Bull World Health Organ; 73(4): 443–8.

Rice, A.L., Sacco L., Hyder A., Black R.E. (2000). Malnutrition as an underlying cause of childhood deaths associated with infectious diseases in developing countries. Bull World Health Organ. 778: 107–1221.

Salve, S.P, Nalavade V.M. and Kshirsagar R.B. (2010). Development and quality evaluation of rajkeera seed biscuits and cookies. Ind .J. Nutr. Dietet; 47: 540–44.

Swapna, C., Kapil U., Gnanasekaran K., Sachdev H.P.S, Pandey R.M. and Bhanti T. (1996). Nutrient intake among adolescent girls belonging to poor socioeconomic group of rural area of Rajasthan. Indian Paediatrics, 33: 197–200.

Tomkins, A. (2001). Vitamin and mineral nutrition for the health and development of the children of Europe. Public Health Nutrition, 4(1A): 91–99.

Wardle, J. and Parmenter K. (2000). Nutrition knowledge and food intake. Appetite. 34(3): 269–75.

WHO (1995). Physical status: The use and interpretation of anthropometry. Report of WHO Expert Committee. WHO Technical Report Series 854. Geneva: World Health Organization.

WHO (1986). Use and interpretation of anthropometric indicators of nutritional status. Bull World Health Organ., 64: 929–41.

World Bank (1996). Improving women's health in India. Development in Practice Washington D.C.

PERFORMANCE EVALUATION OF EQUITY MUTUAL FUNDS: SELECTED EQUITY DIVERSIFIED MUTUAL FUND SCHEMES

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ABSTRACT

Mutual Fund pools the savings of investors for collective investment in a diversified portfolio of securities. With an investment in a mutual fund, one buys units or portions of the mutual fund and becomes a shareholder or unit holder of the fund. Mutual funds provide good returns with less risk as the risk and return are shared amongst a large number of unit holders. This paper aims to evaluate the performance of selected open ended equity diversified mutual fund schemes in the Indian market. For the purpose of this study twelve schemes of various Asset Management Company are studied over the period of 60 months with Net Asset Value data from October 2010 to September 2015. The paper analyzes the performance considering the returns, risks and benchmark returns.

Keywords: equity; mutual fund; risk-returns; performance; beta

Introduction

A mutual fund is a financial intermediary that pools the savings of investors for collective investment in a diversified portfolio of securities. A fund is 'mutual' as all of its returns, minus its

expenses, are shared by the fund's investors. Mutual funds provide investment options to retail investors or individual investors those who are not aware about stock market movements and still want to invest in stock market with a small amount of money. A mutual fund is a pure intermediary which performs the basic function of buying and selling security on behalf of its investors or unit holders.

Mutual fund is the connecting bridge that allows a group of investors to pool their money together with a predetermined investment objective. They are responsible for investing the gathered money into specific securities of stocks or bonds. They invest their money on behalf of investors. For this they charge only a nominal fee. Mutual funds provide more return with less risk. The main advantage of mutual fund is that it diversifies the risk because the pooled money is invested in diversified portfolio.

Diversified equity funds invest across market capitalizations and sectors. Such active diversification ensures the negative performance of one sector does not affect the entire portfolio and increases the possibility of making a sustainable return. These funds aim for medium to long term capital appreciation and suitable for investors having moderate risk profile and investment horizon of at least three to five years.[1]

There are numerous studies on performance evaluation of mutual funds, including studies of Choudhary and Chawla (2014), Narayanasamy and Rathnamani (2013), Vasantha and Maheshwari (2013), Prajapati and Patel (2012), Subha and Bharathi (2007) etc. A number of studies are based on evaluations that examine the performance of mutual fund on their fund return, risk and performance ratios (Zaheeruddin et al 2013). The performance evaluation can be done by evaluating the performance of an Asset Management Company, the fund's own performance and the performance of its family (Brown and Wu 2012); performance of select mutual fund schemes, fund manager styles, open ended mutual funds (Dhanda et al 2012); growth oriented funds (Lohana 2013) performance of private and public sector funds returns (Alekhya 2012) Using standard mutual fund performance measures

and whose characteristics mimic actual funds, using event-study procedures that analyze a fund's stock trades (Kothari and Warner 2001) or even performance evaluation of self designated benchmark indices (Sensoy 2009).

Another prominent study by Hereil et al (undated) studied the persistence of mutual fund performance. According to them academic research often focuses on fund returns, sometimes adjusted for style and market capitalisation biases and ignore fund rating systems which play a central role in the asset management industry. By using a Markov modeling, they found that the persistence of the performance is relatively poor with respect to the time horizon of investors as the rating system is not necessarily time-homogeneous and the importance of style is crucial when comparing the ratings of mutual funds. They conclude that fund selection is more art than science, and that quantitative analysis must be combined with qualitative insight. Historic mutual fund returns are the first thing investors look while comparing funds returns. An investor should also look at the source and tools used to calculate such returns.

About the Study

The objectives of the study were:

1. To evaluate the performance of selected diversified mutual funds schemes.
2. To measure the risk-return relationship and market volatility of the selected diversified mutual funds.
3. To compare the returns of selected mutual fund schemes with its benchmarks returns.

The period of the study is for five years from October 2010 to September 2015. The study uses a sample of twelve mutual fund schemes under the open ended growth equity diversified funds category of Asset Management Companies. The data is purely secondary in nature and is collected from fact sheets, journals and online articles. The Net Asset Values (NAVs) are collected from websites of moneycontrol.com, AMFI, smartinvestor.com etc. For

the purpose of comparing the returns of diversified equity fund schemes the most acceptable benchmarks are S&P BSE 100, S&P BSE 200, CNX 200 and CNX 500, as majority of the Diversified Equity Mutual Funds in India are associated to these benchmarks.[2] Microsoft Excel is used for all the calculations. To analyze the following statistical methods and techniques have been used: average return was calculated for analyzing return on mutual funds and for risk analysis, Standard Deviation (Total Risk), Beta (Systematic Risk) and Coefficient of Determination are calculated. For the purpose of the study the following selective the mutual fund schemes have been selected with their respective benchmark:

Sr No.	Name of the Scheme	Benchmark
1.	HDFC Capital BuilderFund	CNX 500
2.	DSP Blackrock Equity Fund	CNX 500
3.	Kotak Opportunities	CNX 500
4.	Franklin India High Growth Companies Fund	CNX 500
5.	HSBC India Opportunities Fund	S&P BSE 500
6.	Birla Sunlife Equity Fund	S&P BSE 200
7.	IDFC Classic Equity Fund	S&P BSE 200
8.	TATA Equity Opportunities Fund	S&P BSE 200
9.	Axis Equity fund	S&P BSE 200
10.	Canara Robeco Equity Diversified	S&P BSE 200
11.	Reliance Equity Opportunities Fund	S&P BSE 100
12.	SBI Contra Fund	S&P BSE 100

Returns

The evaluation of returns is done by comparing the returns of a mutual fund scheme with the returns of a benchmark portfolio. In this study, average return is obtained by taking the simple mean of yearly returns, where yearly returns are calculated by using the NAVs of the mutual fund scheme.

Table 1: Return of Mutual Fund Schemes

Sr. No	Name of the Scheme	Returns 2014-2015	Returns 2014-2013	Returns 2013-2012	Returns 2012-2011	Returns 2010-2011	Average Return (Yearly)
1.	HDFC Capital Builder Fund	7.56	59.9	-2.39	13.23	-15.79	12.50
2.	HSBC India Opportunities Fund	6.18	66.02	-5.84	13.33	-13.79	13.18
3.	Birla Sun life Equity Fund	12.98	66.69	-2.3	13.85	-23.38	13.57
4.	IDFC Classic Equity Fund	6.77	32.49	1.51	13.21	-20.86	6.62
5.	Reliance Equity Opportunities Fund	9.99	70.82	-7.52	23.3	-14.72	16.37
6.	TATA Equity Opportunities Fund	12.89	47.91	2.44	15.01	-17.79	12.09
7.	DSP Blackrock Equity Fund	7.06	61.57	-8.22	9.7	-15.89	10.84
8.	Axis Equity fund	5.93	42.06	8.26	15.39	-18.32	10.66
9.	Canara Robeco Equity Diversified	7.02	44.1	-0.96	15.91	-12.39	10.74
10.	Kotak Opportunities	14.77	48.58	-0.48	14.43	-19.51	11.56
11.	SBI Contra Fund	9.69	-6.04	-6.04	11.45	-22.78	-2.74
12.	Franklin India High Growth Companies Fund	15.74	75.21	4.2	17.97	-21.02	18.42
	CNX 500	3.88	45.06	-1.48	15.40	-20.73	8.42
	S&P BSE 500	-1.34	16.36	16.41	31.06	-1.29	8.35
	S&P BSE 200	3.35	41.56	-0.06	15.82	-21.37	7.99
	S&P BSE 100	1.01	39.08	1.63	-33.33	-20.53	-2.47

Source: http://smartinvestor.business-standard.com/mf/returnCalculator

Table 1 shows the *average returns* of the diversified equity mutual funds for the period of five years; ten out of twelve have earned higher average returns compared to their respective benchmark

portfolio average returns. The top performing fund, in descending order are Franklin India High Growth Companies Fund, Reliance Equity Opportunities Fund, Birla Sunlife Equity Fund, HSBC India Opportunities Fund, HDFC Capital Builder Fund, Tata Equity Opportunities Fund, Kotak Opportunities Fund followed by DSP Blackrock Equity Fund, Axis Equity Fund and Canara Robeco Equity Diversified. The two funds that has shown below average returns compared to the average benchmark returns was IDFC Classic Equity Fund and negative returns was SBI Contra Fund.

Risk Returns Performance Evaluation

Mutual Fund performance must be evaluated on a risk to returns basis as neither risk nor returns alone provides a sufficient means of evaluation. Together they describe the tradeoffs needed to assemble a portfolio that is efficient and helps to maintain the volatility across different market cycles. The three statistics that can be used to screen mutual funds on a risk to return are Standard deviation, *Beta* and *R-Square*.

Table 2: Return and Risk of Mutual Fund Schemes

Sr No.	Name of the Scheme	Average Return (Yearly)	Total Risk (Standard Deviation)	Beta	R-Square
1.	HDFC Capital Builder Fund	12.50	28.70	1.159	0.963
2.	HSBC India Opportunities Fund	13.18	31.35	0.795	0.121
3.	Birla Sun life Equity Fund	13.57	33.31	1.404	0.949
4.	IDFC Classic Equity Fund	6.62	19.33	0.827	0.978
5.	Reliance Equity Opportunities Fund	16.37	33.88	0.82	0.445
6.	TATA Equity Opportunities Fund	12.09	23.87	1.018	0.973
7.	DSP Blackrock Equity Fund	10.84	30.28	1.201	0.929
8.	Axis Equity fund	10.66	21.66	0.928	0.981
9.	Canara Robeco Equity Diversified	10.74	21.36	0.913	0.976
10.	Kotak Opportunities	11.56	25.00	1.011	0.965
11.	SBI Contra Fund	-2.74	13.96	0.228	0.157

continued...

Sr No.	Name of the Scheme	Average Return (Yearly)	Total Risk (Standard Deviation)	Beta	R-Square
12.	Franklin India High Growth Companies Fund	18.42	35.32	1.432	0.97
	CNX 500	8.42	24.29	1	1
	S&P BSE 500	8.35	13.75	1	1
	S&P BSE 200	7.99	23.11	1	1
	S&P BSE 100	-2.47	27.54	1	1

Source: Authors' compilation

Table 2 reveals the statistical parameters used to evaluate the performance of the selected diversified mutual fund scheme.

The standard deviation is a measure of a mutual fund's volatility. It measures the degree to which a fund's return fluctuates in relation to its average return over a period of time. The higher the standard deviation, the more volatile the fund, and hence, more risky as the fund's performance will rise and fall drastically in a short period of time. The funds Franklin India High Growth Companies Fund, Reliance Equity Opportunities Fund, Birla Sun life Equity Fund, HSBC India Opportunities Fund and DSP Blackrock Equity Fund hold high deviation from the average returns and hence are risky. Usually, as standard deviation increases, so does the return due to the risk-return trade-off. Here the above schemes have the highest deviation and also the highest return for the period proving the concept of high risk and high return.

Beta is also a measure of volatility and tells how risky a fund is in comparison to the market. It measures the sensitivity of a fund's return to swings in the market. The market's beta is always one. The benchmark's beta value is equal to that of the market. If the beta is less than one, it indicates less volatility than the market, and vice-versa. Six of the twelve schemes have a beta which is less than one which indicate less volatility compared to the volatility of the bench mark. The other six schemes namely Franklin India High Growth Companies Fund, Birla Sun life Equity Fund, DSP

Blackrock Equity Fund, HDFC Capital Builder Fund, TATA Equity Opportunities Fund and Kotak Opportunities have a beta of one and above indicating high volatility compared to the benchmark.

R-Square is a ratio which explains how closely a fund's performance correlates with the performance of the overall market. It measures the percentage of a fund portfolio's movement that can be explained by the movement of the benchmark index. R-square values range from zero to one, where zero indicates no correlation, while one indicates perfect correlation. Table 2 shows the R-square of the nine schemes is close to the performance of the benchmark performance except that of Reliance Equity Opportunities Fund, HSBC India Opportunities Fund and SBI Contra Fund where the *R-Square* value is very low indicating no correlation to performance of the benchmark.

Benchmark and Mutual Fund Scheme Returns

A benchmark, as the name suggests, is a point of reference that tells how a mutual fund has performed vis-à-vis its peers and the market. From the year 2012, SEBI made it mandatory for fund houses to declare a benchmark index. This benchmark is independent and is based on the objectives of the fund.[3]

Table 3: Comparative Analysis between Mutual Fund Schemes and Benchmark Return

Sr No	Name of the Scheme	Absolute Returns One Year 2014-2015	Annualized Returns Two Years 2013-2015	Annualized Returns Five Years 2010-2015
1.	HDFC Capital Builder Fund	7.56	72.04	62.16
2.	HSBC India Opportunities Fund	6.18	75.81	63.41
3.	Birla Sun life Equity Fund	12.98	87.48	61.47
4.	IDFC Classic Equity Fund	6.77	41.21	30.06
5.	Reliance Equity Opportunities Fund	9.99	87.62	84.78
6.	TATA Equity Opportunities Fund	12.89	67.2	64.2

continued...

Sr No	Name of the Scheme	Absolute Returns One Year 2014-2015	Annualized Returns Two Years 2013-2015	Annualized Returns Five Years 2010-2015
7.	DSP Blackrock Equity Fund	7.06	72.62	47.39
8.	Axis Equity fund	5.93	49.8	54.23
9.	Canara Robeco Equity Diversified	7.02	53.68	56.27
10.	Kotak Opportunities	14.77	70.1	58.11
11.	SBI Contra Fund	9.69	63.99	34.41
12.	Franklin India High Growth Companies Fund	15.74	102.76	100.64
	CNX 500	3.9	47.53	33.23
	S&P BSE 500	3.49	47.49	29.5
	S&P BSE 200	3.23	44.73	29.95
	S&P BSE 100	0.7	38.87	-25.47

Source: http://smartinvestor.business-standard.com/mf/returnCalculator

Ascertaining whether a fund has outperformed is an important criterion for analyzing a mutual fund performance. If the fund delivers higher returns than the benchmark, it is said to have outperformed and vice versa. On the other hand, if the benchmark index falls over a period of time, and during the same time the fund's NAV falls lesser in percentage terms, the fund is still said to have outperformed the benchmark. Hence, fund performance *greater than* benchmark is outperformance; fund performance *less than* and *equal to* the benchmark is underperformance.[4]

Table 3 shows a comparative analysis of scheme performance with their benchmark. HDFC Capital Builder Fund, DSP Blackrock Equity Fund, Kotak Opportunities and Franklin India High Growth Companies Fund have CNX 500 as their benchmark. These funds have consistently outperformed their benchmark for one, three and five year period. Amongst them Franklin India High Growth Companies Fund is the star. Mutual fund schemes with BSE 200 also outperformed their benchmark with Birla sun life equity fund doing remarkably well. HSBC India Opportunities

Fund outperformed its benchmark as well. Amongst Reliance Equity Opportunities Fund and SBI Contra Fund which have BSE 100 at their benchmark did average considering the benchmark recorded a negative return for the period of five years.

Conclusion

Attention is given to past performance using historical prices and based on historical prices investors decide upon allocating their funds. Of course, it is important to keep in mind that good history does not mean good performance in the future. While quantitative and statistical methods help build investor confidence while choosing a fund, they are essential while evaluating a holding and for portfolio analysis.[5]

In India, countless mutual fund schemes are available to investors which confuse them to pick one as a good return on investment. This study provides some insights on mutual fund performance so as to help the common investors in taking the right investment decisions for assigning their resources in correct mutual fund scheme. The data employed in the study consisted of yearly NAVs for the open-ended diversified equity schemes. The study utilized benchmark portfolios according to the benchmark declared by respective Asset Management Company on their fact sheets. The performance of sample mutual fund schemes has been evaluated in terms of returns and risk analysis. The performance of mutual fund in terms of average returns, sixty percent of the diversified fund schemes have shown higher and superior returns and remaining have shown inferior returns. In terms of standard deviation, fifty percent of the selected schemes are less risky than the market. Eight of the mutual funds schemes have beta less than one which imply that they were less risky than the market portfolio whereas four have beta more than one indicating high risk compared to the market and in terms of r-square nine funds are near to one which indicates higher diversification of portfolio.

NOTES

1. See: Diversified Equity Funds; http:// www.advisorkhoj.com › Advisorkhoj › Article › Mutual Funds
2. See: Understanding Performance w.r.t the Benchmark. http:// timesofindia.indiatimes.com/business/mf-simplified/articles/What-is-a-Mutual-Fund-Benchmark-Why-is-it-important/articleshowhsbc/28842760.cms
3. See: What is a Benchmark? http://timesofindia.indiatimes.com/business/mf-simplified/articles/What-is-a-Mutual-Fund-Benchmark-Why-is-it-important/articleshowhsbc/28842760.cms
4. See: Understanding Performance w.r.t the Benchmark. http:// timesofindia.indiatimes.com/business/mf-simplified/articles/What-is-a-Mutual-Fund-Benchmark-Why-is-it-important/articleshowhsbc/28842760.cms
5. See: What should a newbie investor or the typical retail investor do? http://freefincal.com/quantitative-vs-qualitative-mutual-fund-analysis/

REFERENCES

Alekhya P. (2012). A study on performance evaluation of public & private sector mutual funds in India. .Asia Pacific Journal of Marketing & Management Review, 1(2): 147–168. Retrieved from indianresearchjournals.com/pdf/APJMMR/2012/October/12.pdf

Brown, D. and Wu Y. (2012). Mutual fund families and performance evaluation. Available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1690539&rec=1&srcabs=467282&alg=1&pos=3

Choudary, V. and Chawla P. (2014). Performance evaluation of mutual funds: A study of selected diversified equity mutual funds in India. International Conference on Business, Law and Corporate Social Responsibility. Retrieved from http://icehm.org/siteadmin/upload/6520ED1014025.pdf

Dhanda, S,. Batraand G.S. and Anjum B. (2012). Performance evaluation of selected open ended mutual funds in India. International Journal of Marketing, Financial Services & Management Research, 1(1): 29–38. Retrieved from http://www.indianresearchjournals.com/pdf/IJMFSMR/2012/January/3_IJMFMR_SUKHWINDER.pdf

Hereil P., Philippe Mitaine Nicolas and Roncalli M.T. (undated). Mutual fund ratings and performance persistence. Retrieved from: http://thierry-roncalli.com/download/lwp-mfr.pdf

Kothari, Warner (2001). Evaluating mutual fund performance. Journal of Finance, LVI(5). Retrieved from http://web.mit.edu/kothari/www/attach/kwmfjanuary98.pdf

Lohana, M. (2013). Performance evaluation of selected mutual funds. Pacific Business Review International, 5(7): 60–66.

Narayanasamy, R., and Rathnamani V. (2013). Performance evaluation of equity mutual funds (on selected equity large cap funds). International Journal of Business and Management Invention. 2(4): 18–24. Retrieved from: http://www.ijbmi.org/papers/Vol(2)4/version-2/C241824.pdf

Prajapati, K. and Patel M. (2012). Comparative study on performance evaluation of mutual fund schemes of Indian companies. Researchers World. 3(3): 47–59. Retrieved from http://www.researchersworld.com/vol3/issue3/vol3_issue3_3/Paper_07.pdf

Sensoy, A. (2009). Performance evaluation and self-designated benchmark indexes in the mutual fund industry. Journal of Financial Economics. Retrieved from papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID1088973_code386565.pdf

Subha, V. and Bharathi J. (2007). An empirical study on the performance of select mutual fund schemes in India. Journal of Contemporary Research in Management, 1(1). Retrieved from:http://www.psgim.ac.in/journals/index.php/jcrm/article/viewFile/160/167

Vasantha, S. and Maheshwari U. (2013). Evaluating the performance of some selected open ended equity diversified mutual fund in Indian mutual fund industry. International Journal of Innovative Research in Science, Engineering and Technology, 2(9). Retrieved from: http://ijirset.com/upload/september/69_Evaluating.pdf

Zaheeruddin, M., Sivakumar P. and Reddy K.S. (2013). Performance evaluation of mutual funds in India with special reference to selected financial intermediaries. IOSR Journal of Business and Management. Retrieved from http://iosrjournals.org/iosr-jbm/papers/Vol7-issue2/D0723440.pdf

EXAMINING ENVIRONMENTAL EDUCATION IN PRESCHOOL ENVIRONMENTS IN GOA: IS THERE ROOM FOR CHANGE?

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ABSTRACT

A few decades ago, Goa was a place not yet touched by modernity. The love for nature and a lifestyle mirroring a close relationship with nature was a norm from days of youth, through field cultivation, gardening, and other activities of natural living and waste management. Older Goans knew about plants, whose roots could filter water naturally; which plants could lure away pests from crops, and about many other indigenous and environmentally friendly methods of life. Today, much of this has changed. The culture of childhood that played outdoors is gone and children's life has shifted indoors. In recent years, environmental education is a school-taught subject and no longer learnt as a part and parcel of daily living. However, most schools imbibe environmental activities that are merely add-ons to an already overloaded curriculum. The experiences and learnings of the early childhood years, in fact, are crucial for the formation of values and attitudes that children carry with them throughout life. Regular positive interactions with nature and watching parents and teachers modeling enjoyment

of and respect for nature within the preschool environment, cultivates proactive feelings and behaviours toward the natural world. The preschool environment (social and physical) may be a key factor in imparting environmental education in an integrated way that may help foster internalization rather than superficial learning. This paper offers an overview of current practices used to impart environmental education and provides recommendations for making environmental education more experiential and personalized for young children, based on educational philosophies of Rousseau, Pestalozzi, Froebel, Tagore and Tarabai Modak. This paper makes an attempt to highlight the various challenges which hamper the growth of the Indian agricultural sector; at the same time it tries to make some recommendations for the benefit of the sector.

Keywords: Goa; environment; education; philosophers; preschool

Review of Literature

With the advent of industrialization, agricultural occupations and lifestyles began to be replaced by work and life in buildings of concrete. Open spaces started disappearing and trees and water bodies were replaced with buildings and swimming pools. Schools in 'angans' and under trees moved to buildings and under roofs. Open spaces were closed in by walls and doors, which limited children to just about an arms distance of space. Rooms became spaces of work and play as well. Classrooms and halls were the new playgrounds of children. The culture of children playing outside disappeared and children's daily life shifted indoors (Moore 2004). Several researchers have lamented about this condition, which isolates children from nature (e.g. Wilson 2012). Pyle (1993) called this the 'extinction of experience', which cultivates apathy towards environmental issues. Research substantiates that children's regular outdoor play in contact with the natural world cultivates a positive environmental ethic with some authors saying that the window of opportunity for developing positive attitudes towards

the environment lies in the early and middle childhood (preschool and primary school) years. This requires regular contact with the natural world (e.g. Phenice and Griffore 2003). With most children entering the academic world at the preschool stage, the preschool setting becomes an important place for the presentation of opportunities to build this 'connect' with nature. Therefore, this paper seeks to examine current practices in facilitating environmental education in early childhood, ascertain if there is room for positive change and propose recommendations for the same.

Early childhood is the most significant phase of the lifespan in which the greatest amount of development takes place. These are the foundational years upon which rests the shaping of the individual's life (Environment Protection Authority – EPA, 2014). It is at this age that attitudes towards the environment are formed (Stapp 1978).

Environmental Education has been the key interest of schools for the last 30 years (Lasso de Lavega 2014). However, many schools in Goa imbibe environmental activities that are just add-ons to an already overloaded curriculum (Disinger 1997). In addition, environmental education is imparted in schools from an adult's rather than a child's perspective (White 2006), which is didactic and abstract when children are at an age of grasping only concrete experiences (Piaget 1983). To learn about nature, nature itself is the best teacher. Textbooks are far removed from natural experiences (Coffey 2001) as it is in nature itself that the child will be able to discover concrete experiences. This is why preschool is also known as kindergarten which means 'children's garden'. This name was coined by Freidrich Froebel, the originator of meadow schools, whose education philosophy resulted in each child having a garden of their own within a common garden, to use as they wish to learn and play (North American Association for Environmental Education – NAAEE, 2010). A few decades ago, children who grew up in Goa, did so amidst lush green hills and valleys, had their own little gardens to play in even in the remotest of villages, and played on trees, while at the same time nurturing them into fruitful

abundance. They brought fruit down with a "catty" (Goan lingo for a 'catapult') and knew which plants were edible and which were not. All these provided natural experiences for children to grow amidst nature, often barefoot, in touch with the soul of the land.

Sobel (1996) opined that children's experiences during early childhood gave form to values and attitudes that they would carry with them throughout life. This is because the early environmental experiences are critical in shaping later environmental education (Tillbury, as cited in Wilson 2012). Having positive interactions in nature is also important for healthy development and for facilitating the development of a child's emerging sense of wonder and awe for nature. It is wonder that is the directing force rather than books and talks and learning facts about nature that helps in environmental education in the early childhood years (Wilson 2012). Thus, regular positive interactions within nature and watching parents and teachers modeling enjoyment of, and respect for nature within the preschool environment, would cultivate proactive feelings and behaviours toward the natural world (Phenice and Griffore 2003).

The way the physical environment is planned also has an effect on children's learning (Mashburn 2008). Froebel, the father of modern kindergarten believed that the way we build an environment around the child helps in guiding and inspiring the child's behaviour (Callahan 2014). A space that is filled with furniture can lead to misbehavior and frustration. However an open space with almost no stimulation can also have the same effect. The way the environment is planned, comprises the 'invisible curriculum' which shapes children's sense of belonging and their opportunities for experiencing their world rather than being 'taught' with no concern for the context of their surroundings (Catron and Allen 2007).

An environment can provide three kinds of experiences: direct (unplanned contact with nature while walking or driving through a farm on your way to someplace else), indirect (structured or planned contact with nature like a visit to the zoo or a nature walk) and vicarious (symbols or metaphors of the real thing such as pictures, videos, and so on). Though all these contacts are

important, using vicarious experiences to replace direct contact seems unlikely to help children develop love and concern for nature (Kellert 2005).

Children develop emotional attachments to what they are comfortable and familiar with (Wilson 2012). This again reiterates the importance of bringing the outdoor environment into their everyday classroom. Researchers also suggest that environmental education opportunities should be ongoing rather than sporadic (Wilson 2012). This purpose is served if these opportunities are situated in the environment themselves. Thus, the preschool environment (social and physical) may be a key factor in imparting environmental education in an integrated way that may help foster internalization and a love for nature and life rather than only superficial and vicarious teaching and learning.

Observations and Experiences

This paper aims to summarize the observations and experiences of the researchers in the process of their exposure to a number of preschools across Goa, and to provide their reflections about the same, while also providing concrete suggestions about how environmental education can be made more child and environment centric.

A recurrent observation made in preschool environments in Goa reveals that most classrooms are overcrowded with desks and benches and have many more children than the ideal recommended 1:15 ratio (Catron and Allen 2007). Children are subjected to sit in a fixed position for long durations with hardly any leg space permitting even a tiny jump to a song about frogs. There is little, if any, planned environmental education; very little hands on experience of nature, the most being showing children the germination of wheat grains using pictures and sometimes, real grains. Few preschools have run-of-the-mill, playground structures, while some preschools are housed in flats and buildings that directly open out onto roads.

Outdoor environments of schools are natural spaces for play and exploration. They are also places for creative expression and

learning. Many elite and other schools today do not have access to outdoor areas for the children to do what comes most naturally to them. Most playgrounds attached to schools are what are popularly called 'traditional' playgrounds, with immovable, fixed structures. On the other hand, having 'adventure' playgrounds encourages exploration of nature-related concepts, like for example, the cultivation of a patch of land, observation of birds, insects, activities like cleaning up leaves, and so on, which in turn builds a love for nature and a closeness for nature in children (Catron and Allen 2007).

Most preschool environments promote academic learning and skill development, but not education of the heart and soul. Children's connect with nature begins in the heart and soul and then translates to the mind and to behaviour (Kellert 2005). Children have to learn to love the earth before telling them they have to save it (White 2006). Therefore, preschool environments could be empathetic to children's sensitivities and expressions of feelings. Most school environments do not provide this individualized developmental attention to children primarily due to overcrowding.

Most preschools overuse vicarious learning through pictures and charts to substitute experiential learning. Moreover if there are any real life experiences like a visit to a garden, these are sporadic, and time-bound rather than extensions of the everyday curriculum.

Overview of Philosophical Contributions

World renowned philosophers of education like Johann H. Pestalozzi, Jean J. Rousseau, Friedrich Froebel, Maria Montessori, John Dewey, Rudolf Steiner, and even Gandhiji and Rabindranath Tagore have spoken of direct experiences in and with nature as enhancing child development and learning (Davis 1998). Pestalozzi believed in concrete experiences and demonstrated the use of real and tactile objects like plants and mineral specimens to teach natural science to children. As mentioned earlier, Froebel's Kindergarten philosophy encompasses the care and study of

plants in a garden to awaken children's natural interest in nature as he considered it vital for children to grow up in synchrony with nature. Based on previous experiences with children in a garden, Froebel was convinced that the best ways to educate were through direct observation and action (Weston 1998). In the words of Benjamin Franklin (1985), "*Tell me and I forget. Show me and I may remember. Let me do and I understand*".

An interesting aspect of Froebel's philosophy is the demonstration of unity and interconnectedness of nature through simple finger rhymes. For example, after singing the rhyme pat-a-cake, it may be probed: who gave the cake – the baker; with what did he make the cake – flour; where did he get the flour from – wheat; where did the wheat come from – the field; how did it grow in the field – God gave the rain and soil to grow the wheat; thus, all we do and say is connected to nature and thus, to a higher power.

According to Rousseau nature is viewed as one of three sources of education with 'the natural environment as a vehicle for freeing the spirit of children' (Gutek, as cited in Roopnarine and Johnson 1993, 3). Rousseau also emphasized the importance of feelings and the wonders of nature (Dent 1988).

The Waldorf schools founded by Rudolf Steiner use only natural materials in their classrooms. Children are encouraged to make their own toys and materials for exploration and learning from pieces of wood, wool, cotton, and the like. Children learn, through stories of nature, to respect the life forces in the environment around them. Eurythmy, a dance form, capitalizes on using different life forces as an active part of the learning experience (Taplin 2011).

Maria Montessori another proponent of the use of natural and real materials believed that children need to have an environment for learning that reflected aesthetic beauty, which instills in the child awe and wonder, arousing curiosity for learning. Her philosophy makes use of teachable moments, using situations that the child chances upon or discovers for teaching children one-to-one. She believed that children are naturally curious about the outside world, which results in countless teachable moments (Standing 1984).

Like his Western counterparts, Rabindranath Tagore also believed in making natural surroundings a part of learning where he facilitated discipline in caring for self and nature (Pushpanathan 2013). Indian philosopher and founder of the 'anganwadis', Tarabai Modak, believed in education that was in harmony with the child's way of living. Much of the material she used was from the natural environment. Children would go for nature walks, pick up something, exhibit what they found and use that for sensory development as well (Shukla 2004). She like Gandhiji, promoted the use of indigenous materials and locally available teaching that matched with the culture of children (Rao 2012).

Jiddu Krishnamurthy was another Indian philosopher whose educational philosophy included establishing a relationship with nature as evident in the following quote: "*If you establish a relationship with it [nature] then you have relationship with mankind... But if you have no relationship with the living things on this earth you may lose whatever relationship you have with humanity, with human beings.*" (as cited in Yadava 2014). He believed that nature gradually brought healing to the mind and was a demonstration of beauty and order. Due to this, all his education institutions were founded in parks and the countryside. However he did not condemn city schools as he believed that nature could be wholly present even in a blade of grass, a goldfish in a bowl, or a house-plant (Yadava 2014).

Suggestions / Recommendations

Based on these philosophers of education and other researchers a few recommendations for preschools in Goa for making environmental education more experiential and personalized for young children are suggested:

1. De-clutter the classroom of furniture and have children sit on rugs/mats on the floor, to be in touch with the earth. Sitting on the floor also supports their natural physical development and comes to little children more naturally than sitting on chairs. Removing furniture also leaves a lot of open space in the room for children to walk around and explore their surroundings, which supports self-discovery and initiative to learn.

2. Use natural materials in the classroom such as wooden/cloth materials instead of plastic materials that cannot be recycled or reused. However, avoid using food items for activities that are not edible or grown, for example, potatoes for printing (NAAEE 2010).
3. Provide dustbins in each classroom with pictures on it to help children separate wet and dry waste (NAAEE 2010).
4. Provide hands-on experiences by bringing nature into the classroom by way of a nature table (NAAEE 2010) with shells, leaves, rocks, snakes-skin, parts of a honeycomb, nests of birds, a sand tray, a water tray and so on. Perception can be enhanced by using a magnifying glass, playing games like touch/smell and identify which also develops the senses.
5. Use things in nature to create music, like sticks, rocks, sand, wild seeds and so on (NAAEE 2010).
6. As some philosophers have posited, a variety of sensory experiences must be provided in the early childhood years (e.g. Humphryes 2000). EPA (2014) suggests experiences such as listening to the wind in the trees, holding an earthworm, rolling on grass, smelling a eucalyptus leaf, or tasting a freshly picked tomato.
7. Children have a natural affinity towards animals and cultivating real and imagined relationships with animals helps develop empathy and connectedness to nature (Sobel 1996). Having an aquarium for fish, frogs and snails or watching birds at a bird feeder or cows in the fields will help develop the empathy children naturally feel towards animals. Even activities like 'slither like a snail', 'run like a deer' contributes to the 'caring feeling' towards animals and nature. As several researchers like Carson (1956) point out that before knowing about the environment, children have to 'feel' for the environment.
8. Provide opportunities for outdoor exploration daily. This can be done by transforming traditional playgrounds into environmental yards by adding bird feeders, flower and vegetable gardens, tree houses, rock piles, and logs, and then providing children with tools for experimenting and investigating (e.g.,

magnifying glasses, water hose and bucket, digging tools, rakes, etc.) (Wilson 2012). Use natural features in the outdoor environment like a tunnel, mound, grass, sand, gravel (Catron and Allen 2007). Outdoor environment for preschools is very important for environmental education as Dighe (1993, 62) rightly puts it, *"One can hardly imagine a generation of persons with neither interest in nor knowledge of the outdoors making responsible decisions regarding the environment."*

9. Provide indirect learning experiences by way of field trips or nature walks or by bringing in resource persons for demonstrations – for example a snake show. Children can be involved in keeping a kitchen or flower garden outside the school or on the terrace/in the balcony.
10. Teachers can focus on helping the child 'experience' rather than 'teaching.' (Wilson 2014). Using teachable moments, or involving children in planning learning topics will have more impact than the teacher teaching something the children fail to connect with.
11. Teachers can model environmental-friendly behaviours such as re-using paper in class (NAAEE 2010), making their teaching aids out of waste wherever possible, being gentle with animals, expressing feelings of joy and awe at things in the environment rather than disgust or fear and so on. Demonstrating simple ways of expressing care for the environment is far more effective than talking to children about taking care of the environment (Wilson 2012).

Conclusion

Environmental education in the early childhood years is critical in shaping responsible citizens of the world, persons who can live in harmony with nature. However one cannot expect children to spend most of their childhood indoors with books and technology and suddenly demonstrate love and care for nature when put out into the outside world. Environmental education has to be an experience from the early years - an experience that is not handed out from textbooks as facts but one that is 'felt' and 'sensed' in

wonder and awe. This may call for a major revamping of preschools in Goa. Change will take place only when important stakeholders in early childhood such as teachers, parents and the society 'feel' the need for making the change. In the words of Davis (1998, 142), "*It is not good enough to 'educate the children, (just) because the children are the future'. We are our children's futures.*" So, is there room for change? Yes, there is, but the bigger question remains... Who will make the change?

REFERENCES

Callahan, D. (2014). *Importance of environmental design in childhood development, preschools.* Retrieved from: http://www.examiner.com/article/importance-of-environmental-design-childhood-development-preschools

Carson, R. (1956). *The sense of wonder.* New York: Harper & Row.

Catron, C. E. and Allen, J. (2007). *Early childhood curriculum: A creative play model.* Upper Saddle River, NJ: Pearson Prentice Hall.

Coffey, A. (2001). Transforming School Grounds. In T. Grant and G. Littlejohn (Eds.), *Greening School Grounds: Creating Habitats for Learning* (pp. 2–4). Toronto: Green Teacher and Gabriola Island, BC: New Society Publishers.

Davis, J.M. (1998). Young children, environmental education and the future. In Graves, N. (Ed.) *Education and the Environment.* World Education Fellowship, London: 141–154.

Dent, N.J.H. (1988). *Rousseau: An introduction to his psychological, social and political theory.* Oxford: Blackwell.

Dighe, J. (1993). Children and the earth. *Young Children* 48(3): 58–63.

Disinger, J.F. (1997). Environment in the K-12 curriculum: An overview. In Wilke R.J. (Ed.). *Environmental education, teacher resource handbook. A practical guide for K-12 environmental education.* (pp. 23–45). Thousand Oaks, CA: Corwin Press, Inc.

Environmental Protection Authority (June 2003): Social Research Series. *Patches of green: Early childhood environmental education*

in Australia: Scope, status and direction. Retrieved from: http://www.unitingcareageing.org.au/__data/assets/file/0003/90147/patchesofgreen.pdf

Humphryes, J. (2000). Exploring nature with children, *Young Children*, 55 (2): 16–20.

Kellert, S.R. (2005). *Building for life: Designing and understanding the human-nature connection*. Covelo, CA, USA: Island Press.

Lasso de la Vega E. (2004). Awareness, knowledge, and attitude about environmental education: responses from environmental specialists, high school instructors, students, and parents. *Dissertation* from University of Central Florida, Orlando Florida.

Mashburn, A.J. (2008). Quality of social and physical environments in preschools and children's development of academic, language, and literacy skills. *Applied Developmental Science*, 12(3): 113–127.

Moore, R. (2004). Countering children's sedentary lifestyles by design. *Natural Learning Initiative*. North Carolina State University. Available at: www.naturalearning.org

(The) North American Association for Environmental Education (NAAEE). 2010. *Early childhood environmental education programs: Guidelines for excellence*. http://resources. spaces3.com/91ecfc06-2076-4e26-880d-2332e87b5caf.pdf

Phenice, L. and Griffore, R. (2003). Young children and the natural world. *Contemporary Issues in Early Childhood*. 4(2): 167–178

Piaget, J. (1983) Piaget's theory. In Mussen, P. (Ed.). *Handbook of Child Psychology*, 4th ed. Vol. 1. NY: Wiley.

Pushpanathan, T. (2013). Rabindranath Tagore's philosophy of education and its influence on Indian education. *International Journal of Current Research and Academic Review.* 1(4): 42–45.

Pyle, R. (1993). *The thunder trees: Lessons from an urban wildland.* Boston: Houghton Mifflin.

Rao, S. (2012). Educational philosophy of Mahatma Gandhi, *International Journal of Multidisciplinary Educational Research*, 1(4).

Roopnarine, J.L. and Johnson, J.E. (1993). Approaches to early childhood education, 2nd ed., New Jersey: Prentice Hall.

Shukla, R. P. (2004). *Early childhood care and education.* Sarup & Sons. New Delhi.

Sobel, D. (1996). *Beyond ecophobia: Reclaiming the heart of nature education*, Great Barrington, MA: The Orion Society.

Standing, E. M. (1984). *Maria Montessori: Her life and work.* Plume (reprint). U.S.A.

Stapp, W. (1978). An instructional model for environmental education, *Prospecs*, 8(4): 495–507.

Taplin, J.T. (2011). Steiner Waldorf early childhood education: Offering a curriculum for the 21st century. In Linda Miller, Linda Pound (Eds.), *Theories and Approaches to Learning in the Early Years.* New Delhi: Sage Publications.

Weston, P. (1998). *Friedrich Froebel: His life, times, and significance.* London: Roehampton Institute.

White, R. (2006). Young children's relationship with nature: Its importance to children's development & the earth's future, *Taproot*, 16(2).

Wilson, R. (2012). *Nature and young children: Encouraging creative play and learning in natural environments* (Second Ed.). New York, NY: Routledge.

Yadava, S. (2014). *Reflections on the educational philosophy of Paulo Freire and Jiddu Krishnamurti.* Retrieved from: http://www.azimpremjiuniversity.edu.in/ sites/default/files/userfiles/files/Shalini_Yadava.pdf

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6. Spell out numbers from one to nine; 10 and above to remain in figures. For exact measurements use only figures (3 kms, 9 percent - not %).
7. When referring to a century use words, e.g., 'twentieth century' and when reference is being made to a decade use numbers, e.g., '1990s'.
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10. A consolidated alphabetical list of all books, articles, reports, essays etc. referred to should be provided at the end of the article under 'References' (references should include only those sources which were actually made use of and cited in the main text). All sources should be listed in alphabetical

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In case of journal article:

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In case of chapter in edited book:

Nielsen, Jette and Bjorn Melgaard (2004). The economic and security dimensions of HIV/AIDS in Asia. In Jai P. Narain edited, *AIDS in Asia: The challenge ahead*. Chp. 2: 42–57. New Delhi: Sage Publications.

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