Scope and Context
2.1 Infertility: Meaning and Scope:

Infertility is defined as failure to conceive even after 12 months of unprotected intercourse. It can also be referred to as sterility. Further, it is an absolute state of inability to conceive. Fertility, on the other hand, is a relative rather than an absolute state and thus comparatively few individuals are sterile or fully fertile. The majority fall somewhere between these two extremes provided there is no absolute bar to conception on either side. Thus the fertility of a marriage is the sum of the fertilities of the two partners. Reassurance is the psycho-social therapy advocated even in the "medical assistance technology" when couples complain of infertility too soon. Such couples appreciate a simple account of the physiology of conception and an explanation of the fact that the mathematical chances of conception are not so high as they imagined. In all cases optimum should be the keynote, tempered with realism, even when the investigations suggest that the prospects for pregnancy are poor (Jeffcoate, 1975).

Infertility can be primary or secondary. The term primary is used when the patient has never been pregnant. The term secondary is used if the patient has a history of one or more prior pregnancies regardless of whether the pregnancy terminated in a viable or non-viable outcome, the latter including spontaneous or induced miscarriage and/or ectopic gestation (Jeffcoate, 1987).

In an overview of human fertility it was estimated that about 25% of women become pregnant within one month of unprotected intercourse, 63% within six
months. 75% within nine months, 80-90% within a year and only 5% after an additional six months of exposure (Williamson and Elias, 1992). The rate of coitus is recognized as an important determining factor in achieving pregnancy, a frequency of four times per week being optimal (Macleod and Gold, 1953). Maximum fertility in women occurs at around 24 years of age, and thereafter it declines with increasing rapidity until the age of 50 years, when the proportion of couples who can achieve a successful natural pregnancy approaches zero (Tietze, 1957).

Approximately one in seven individuals has a problem with infertility. At face value, an incidence of 14% of the reproductive population put those who are infertile into one of the largest groups requiring medical attention. Although this figure is based on data drawn from the western society, it is believed that a similar incidence exists in most cultures of the world with rates rising to as high as 25% of the reproductive population depending upon the definition of the duration of infertility (Fishel et al, 2000).

Mirroring such variance are the different figures available from different parts of the world. On the whole, data from non-contracepting, healthy populations with couples who married when young, estimate that sterility from physiological causes other than STDs may be as low as 2%. This figure is matched for several populations as shown through demographic surveys (Early and Peter, 1990; Wood, 1994). In contrast, the rate of infertility is estimated to be 14% among western population (Fishel et al, 2000). However, different figures such as 5-8% are attributed to the
western countries considering only primary infertility, presumably related to physiological causes (Bittles and Maston, 2000). Again these primary infertility rates of western countries are contrasted to 30% in areas of Sub-Saharan Africa (Caldwell and Calwell, 2000). Further, many studies indicate regional decline in sperm quantity which is reported to be as high as 50% (Bentley, 2000).

In the United States approximately 15 percent of couples are estimated to be involuntarily infertile. This figure translates into one infertile couple out of every seven marriages. During the past 20 years several factors have contributed to what appears to be an increasing incidence of infertility (Muasher, 1987)

Despite claims that there appears to be an increase in the rate of infertility in Western Europe, studies over the last 20 years point to a fairly stable and consistent prevalence (Thonneau and Spira, 1999). Although there are varying views in the literature, a number of authors believe that nearly twice as many women born 45 years ago presented with problems of infertility compared to women born 60 years ago. This referral uptake of medical help varied considerably from country to country. Similarly, it has been reported that approximately 9% of women born in 1950 were voluntarily childless compared to 1.9% of women born in 1935 (Johnson et al, 1987).
The issue of ‘infertility’ arises when those who appear to be normal report as abnormal with their inability to conceive normally and naturally. Infertility is common among cases affected by STDs, among AIDS / HIV positives, whose genetic factors contribute to infertility. Added to this group are gays and lesbians. The fact is that though the number of infertile individuals among this population is lower, many remain childless by choice regardless of their sexual identity. However, these infertile people can also seek assisted conception technologies. Fishel et al (1996); advocate for forging ahead with new developments, where as, Bittles and Maston (2000) urge for more caution in adopting reproductive technologies that may have unforeseen consequences. Consequently it is cautioned that there is need to evaluate causes of azoospermia and oligospermia which, if resulting from genetic abnormalities, might also result in offspring who inherit the same condition.

Evaluation of the incidence of infertility is difficult, not least because the reviewing of censuses cannot take into account voluntary infertility. As has been rightly pointed out, it is impossible to compute the incidence of human fertility as a raw statistic or to reduce it to a simple figure – Infertility varies from country to country and from cohort to cohort depending upon the sample, population surveyed, whether males are included together with females and so on (Bentely and Mascie – Taylor, 2000).
2.2 Infertility and the Country:

India stands next to China in population increase. In both Asian countries, fertility rates of the population have gone beyond carrying capacity and new measures are taken to combat the population explosion through family planning measures, thereby reducing fertility rates to minimum. However, the problem of infertility remains, as at least 10% of the couples have some biological problem or socio-cultural and psychological problems to conceive. The well being of couples is so important as everyone envisages successful limited fertility.

2.3 Infertility and Social Implications:

Infertility of a couple in Hindu society is viewed seriously. The common tag attached is that sinners don’t beget children. Further, it is the result of past deeds as well as that of past births. However, the main epics of the Hindus, Ramayana and Mahabharatha, show that all heroes were however born to infertile couples thorough divine blessings after performing several Pujas (prayers), Yagnas (sacrifice ceremony) and by way of Daana Dharmas (giving away charities). The members of the present society have too inherited thus the same cultural norms. To whatever ethnic group one belongs in the Hindu Varna (caste) system such as Brahmin, Kshatriya, Vysya and Sudra, the cultural treatment to an infertile couple is the same; as a result of their sinful acts the couple could not beget the child. This would lead to authorization for the husband to remarry rather than correcting the problem. As such polygyny was a common phenomenon until recently. The situation has been changing.
since 1990s with the establishment of 'infertility clinics' and the development of assisted conception technologies. Today, two important matters can be noticed among the married couples. One, the couple having no problem of 'infertility' will go for permanent sterilization after desired number of children, mostly one or two. Second, the other type of couples affected by infertility now avail assisted conception technologies and are happy when their wanted pregnancy materializes.

The Government of India has a Ministry of Family Welfare meant to implementing its policy of limiting the family size through temporary and permanent sterilizations and also in the promotion of child-bearing programmes to the childless couples.

The causes of infertility are manifold and complex. Infertility is associated with biology and culture. Until recently and even today, Indian society views infertility as a problem of female and thus act as a curse upon her. However, assisted reproductive technologies provide several ways for people to have children who might not otherwise be able to do so.

2.4 Anthropologists’ Interest in Infertility Studies:

Anthropologists study human populations bio-culturally through holistic approach. For anthropologists, both biology and culture, are important to evaluate the population in the right perspective. Anthropologists are associated with different areas of research namely, genetics of human populations, demographic profiles,
human growth, development and nutritional studies to mention few. Anthropologists, particularly biological anthropologists, cover much wider fields of research that are associated with bio-cultural processes of human societies. The area of research, infertility of male or female, is yet another field of interest which likely contributes to the widening horizons of the subject matter. The use of the methods and techniques of other sciences adds to the qualitative increase of the subject matter for better understanding and well being humanity.

Thus, anthropologists' interest in 'infertility' is to find out the bio-cultural perspectives of the problem and the ways and means by which the populations overcome the biological stress through their cultural technologies. The hypothetical view of Indian Hindu Society is that it could identity the changing life matters and recognize their modern and scientific base. This welcome trend and needs to be strengthened by further scientific inquiry. A larger section of the society is still influenced by its traditional belief system, economic backwardness, horoscope reading, soothsaying and calculation of planetary influence.

2.5 Infertility and Bio-Medical Perspectives:

The causes of infertility are found both in males and females and need biomedical attention by which many of them could be cured. Only few are finally stamped as total sterile and reasons for total infertility could be genetic, environmental or both (Bittles and Matson, 2000; Bentley, 2000 and Caldwell and Caldwell, 2000). The reasons for male infertility are mainly oligospermia to
azooospermia with other endocrine and chromosome dysfunction. In women, however, the problems are many; dysfunctions of ovulation, endocrine and chromosomes, tubal blocks and diseases, endometriosis, sperm antibodies and others. The incidence of cause of infertility in males is 32% while in females it is 64% and that due to other unknown causes is 4%. However, since the advent of assisted reproductive technologies for humans, these have manipulated human reproductive processes effectively. However, there has been ethical debate, particularly in traditional and orthodox societies, often obscuring the dramatic advances that have changed the state of infertility (Barnes et al. 1995; Gardner et al. 1996; Fishel et al., 2000; Hoover et al., 1997; Johanson et al., 1992 and Palermo et al., 1992). The apparent efficiency of the process whereby genetic factors affect infertility is minimum, because such persons form a quite small percentage of persons. However, fetuses with genetic abnormalities are usually eliminated by spontaneous abortion. Further, as the Human Genome Project (HGP) progresses, our understanding also increases on how and why specific genetic disorder with many aspects of human reproduction should improve, and on our ability to overcome these difficulties become concomitantly more focused (Baird et al., 1988; Carr, 1971; Chandley, 1997; Franks et al., 1997; Hertig, 1967; MacLeod and Gold, 1953; Reed and Lowell, 1958; Tournaye et al., 1997; Vogt, 1995; Williamson and Elias, 1992).

In the present study, attention is paid to find out the nature of infertility that the population experiences and the ways by which the problem is resolved. It is
planned to collect the bio-medical data on infertility couples such as age, marital relation, mating pattern, period of infertility, nature of infertility through medical examination, and other anthropometric information. The results of clinical and laboratory investigations are also made use of in interpreting the data.

2.6 Infertility and Environmental Factors:

Many studies have focused on environmental pollutants that are believed to affect human reproductive potential. For example, Xenoestrogens—substances present in many human-made products such as plastics have been linked to apparent dramatic decline in human sperm counts. The results of a Danish study which are a testimony to male infertility (Carlsen et al., 1992). However, Olsen et al., (1995) point out a substantial inconsistency between the findings of the Danish study and those of MacLeod and Gold (1951) and MacLeod and Wang (1979). Decreasing sperm counts in humans seem to be the outcome of many studies. The reasons attributed to it are not only physical environmental agents but social environment of male (Baird and Wilcox, 1986; Bendvold, 1997; Bentley et al., 1998; Chandra and Stephen, 1998; Comhaire, 1993; Farrow, 1994, 196; Feichtinger, 1991; Fisch and Goluboff, 1996; Forti and Serio, 1993; Nelson and Bunge, 1974; Olsen et al., 1995; Polansky and Lamb (1988); Snyder, 1990; Stephen and Chandra, 1998; Swan et al., 1997; Turner and Sharpe, 1997; Vine, 1996; Vine et al., 1994). Finally, it should be stressed that the link between sperm counts and fertility is also unclear (Barrow et al., 1993; Forti and Serio, 1993; MacLeod and Gold, 1951). The currently accepted fertility threshold of \(20 \times 10^6/\text{ml}\) does not strictly be of individual fertility by t is merely a useful
guideline (Hargreave and Elton, 1983; Polansky and Lamb, 1988). In other words, there is no linear relationship between sperm counts and fertility.

Bartoov et al. (1993) conclude that male fertility potential is a multifactorial phenomenon. A major omission in the xenoestrogen hypothesis is the failure to deal adequately with female reproductive health. There are no data to support an increase in female reproductive health, including breast cancer that could be associated with xenoestrogens. There are no data to support a general increase in human infertility that might be associated with xenobiotics.

A comparison between male-female social environment shows a clear distinction in the use of harmful teratogenic substances through smoking and alcoholic consumption. Males around the works seem to indulge more with these environmental pollutants and hence could be such outcomes as is evident sometimes in dramatic decline in sperm counts all around the works. Hence, the present study endeavours to investigate the social habits of the so called infertile couples to understand the relation between the infertility and social habits.

2.7 Infertility and Social Perspectives:

Childlessness or primary sterility is still a distressing condition for nearly all married women in most of the Third World countries. It can endanger marriage. The reaction of the childless woman's husband, and that of his relatives and the community and society can make her second class citizen and make her life
miserable. This situation prevails in all human societies around the world. The basis for culture or society is folklore which when subjected to scientific truth may differ significantly. It is only the later realization of many cultures that the male determines the sex of the child and the female bears the grunt of delivering female child. Similarly infertility is not the matter of female alone and the male is also equally a causative one. With the boom in assisted conception/ reproduction technologies many of the age-old folklore beliefs are put aside and a perceptible social change has taken place among all human societies that are in the mainstream of national populations (McAllister and Clarke, 2000; Patterson and Friel, 2000; Shaw 1989). A new dimension in this direction is social infertility wherein certain societies as well as couples prefer childlessness by choice the reasons for which are many (Baum, 1983; Campbell, 1983, 1985; Scheneewind, 1997; Templeton, 1992).

The emerging evidence that Human Immune deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have both a biological and social impact on fertility and the role of cultural, social and behavioural factors is stressed (Caldwell et. al 1989; Caldwell and Caldwell, 2000; Collet et.al., 1988; Henin, 1969; Jenkins, 193; Path, 1997; Piot and Tezzo, 1990; Sherries and Fox, 1983; Stanecki and Way, 1997; Wasserheit, 1989; WHO, 1987).

Another dimension gaining ground among the social perspectives of infertility is sexual orientation and fertility. There has been of late much controversy about the
role of this parameter in parenthood. This has particular reference to lesbian, gay and bisexual parents whose issues have been not yet studied or little studied (Patterson and Friet, 2000).

In the present study, this background literature not only indicates the status of research as also helps in the identification of gaps in the field based on which the present project of study is designed. There is no focus on the issues of homosexuals and eunuchs, and on either of the couple or both suffering from HIV/AIDS as their volunteering to infertility clinics is very rare, especially in a traditional and orthodox society, where sex is viewed seriously and no social links exist. Under the circumstances such samples have not formed part of the study. Further, the study pays adequate attention to the psychic conditions of infertile couples.

2.8 Infertility Studies in India:

Fertility studies assume considerable importance in demographic anthropology. However, infertility surveys in populations have never gained place although these cover bio-medical, sociological and psychological dimensions and well-being of couples as also populations. Even the proliferation of infertility clinics occurred during the last about a decade. The clinics started tackling the problems of infertility of the couples especially with the application of the technological progress in ART. The studies made on infertility are only a few, almost all of which are clinical in nature. There are thus no population based studies available at all. Thus, infertility studies are mostly problem-based ones and the subjects are often those who
have taken treatment for the disorder. The published works on males mostly concern those of the low sperm count, immobile sperm, antibodies against sperm, outcome of intracytoplasmic sperm injection (Rajendran et al. 2002; Dhillon and Hussain, 2003; Reddy, V.R. et al. 2003; George et. al. 2003, Dhandekar et al. 2002; Dhawan and Sharma, 2002; Thangaraja et al. 2002; Roy et. al. 2001; Gopalakrishna et. al. 2000; Arora et al. 2000; Mahajan et al. 1999; Sah, 1998; Shetty et al. 1997; Guha et al. 1997; Reddy et al. 1997, Day and Ray, 1993 and Verma et al. 1993). These studies show that male infertility is largely due to either a varicose vein in the scrotum or due to abnormality in the size of the testicles caused by hydrocele. In cases affected by these disorders there often occurs spermatogenic arrest in men with testicular hyperthermia.


In India we lack data-base and the estimated incidence of infertility is approximately 20-25%. There is one community based study (Zargar et al. 1997),
showing 15% of couples were found to be infertile. Semen abnormalities (22.4%), anovulation (17%), ovarian failure (8.8%), hyperprolactinaemia (8.4%) and tubal diseases (7%) were found to be the major cause. Parikh et al. (1997), in their Jaslok Hospital based study from Mumbai reported genital tuberculosis as a major pelvic factor in women. Another community-based study in Mumbai has revealed that sexually transmitted diseases mainly responsible in causing gynaecological problems (Bravin et al., 1998). Tyagi and Singh (1998) find Chlamydia and tubal infertility factor in the women of Meerut. According to them, Chlamydia antibodies are present in 4% of women. Rodin et al. (1998) have found that 52% of the Indian women in England had polycystic ovaries significantly associated with infertility. Rajan (1992) highlights the importance of accepting and practicing the modern diagnostic technologies and refined therapeutic measures. Further, he opines that these modern concepts favour maximising the fertility rate and permit the physician to be minimally invasive in diagnostic or therapeutic approaches.

Shirgaonkar et al. (1988) reveal from their survey of 120 women with infertility of both primary and secondary attending at Gynaec OPD in Patna Medical College Hospital that obstruction of fallopian tube is the most common cause of sterility in women which is most often found to be a sequel to pelvic infection. According to them, the risk of developing infertility goes on increasing with every attack of pelvic infection. This finding is in agreement with the one reported by Las Westrom (1971). Geeta Sinha et al. (1989) based on their data from hospitals in Patna
(Bihar) found anovulation in amenorrhea galactorrhea syndromes and other menstrual dysfunctions associated with infertility.

Desai et al. (1992) attempted their study on 15 randomly selected couples of Baroda town (Gujarat) and found out that infertility is one of these diagnoses in medical practice besides its medical component and that emotional aspects are of profound importance. The study also reveals that infertile couples develop stress due to infertility leading to marital disharmony, sense of isolation and depression. Studies of unexplained infertility associated with antisperm antibody are available and the samples are drawn generally from hospitals (Gupta et al., 1986; Rajan, 1987; Ramani et al., 1988; Maya et al., 1988, Parikh et al., 1986). Neeru Gupta (2002) observes that infertility being a social stigma in the country has a lot of effect on psychosexual and psychosocial health of individuals, couples, families and societies and hence anticipated for large data base. There are practically no environment influenced infertility works of which concern has been raised by many (Ghosh, 1999). The results of these works are in agreement with the findings of other works (Anger et al., 1975; Pajarinen et al., 1997, Whorton et al., 1977).

Many of the above studies thus report cases from hospitals and infertility centres. They lack a research design to show a comprehensive picture of Infertility in a population or human societies of a region. Infertility is just not only a medical problem but encompasses cultural and psychological dimensions too. Hence the
present study is designed to cover all aspects of infertility in populations of a region by considering samples in general population as well as infertility centres to examine the extent of infertility in Tirupati, Andhra Pradesh.

In a developing country like India, population explosion is a major hurdle to several welfare programmes. Therefore, the major thrust of the Government is towards contraception. While the need for population control is well appreciated, family planning should also mean assisting wanted pregnancies. Unfortunately the prohibitive cost of the newer fertility drugs and the assisted reproductive technology procedure often required to treat infertility, remains beyond the reach of a vast majority of infertile couples. Health insurance coverage along with financial support from National Health Scheme could open these options to most of the patients (Ghosh, 1999).

Until recently and even today in many regions (especially rural areas) of India, 'infertility' is based more on folklore than on scientific evidence. It is only during the last few years infertility clinics have come up with all types of conception technologies. A welcome sign of these clinics is 'cure with care' and that there is a good response from the society including the infertile couples. Data from specific populations are totally missing while those on cross-cultural populations are meagre.
Strategies for the management of infertility in India has been emphasized (Gautam Allahabadia, 1999; Ghosh, 1999). Neeru Gupta (2002) reports that the reliable infertility data are not available on specific populations from different regions of the country. Most of the available census data can only give an estimate of family size. The cause of infertility and type of infertility cannot be ascertained from these data. So the first and foremost requirement is a truly representative, population-based sample survey to find out the prevalence rate. It is suggested that both the husband and the wife or couple should be considered as a unit of study.

2.9 Aim and Objectives:

It is against this background that the present has been attempted with aim of investigating the bio-medical and social aspects of infertility mainly from the infertile couples attending infertility clinic along with data on infertility in the general population.

The following are the objectives of the study.

1. To discern infertility levels in the general population and in voluntarily attending infertile couples at infertility clinics availing the facility of assisted reproductive technologies.
2. To decipher the nature of infertility in the couples taking the couple as the unit of the study.

3. To highlight the association of infertility with unexplained factors such as body mass index (BMI), mating patterns and social habits.

4. To investigate the social perspective of infertility specially focusing on psychosexual and psychosocial health of individual, couples, families and societies.

5. To compare results of our study with those of earlier and available works from India and outside to understand the worldwide variation of human infertility.