Buffaloes play an essential role in rural livestock production, particularly in Asia. India occupies almost foremost position among the countries of the world in respect of livestock. As per 19th livestock census India possesses largest number of livestock in the world and ranks first in buffalo population (108 million) (Anonymous, 2014). Jaffarabadi buffalo produces milk with high fat content, has been the breed of choice of buffalo in the Saurashtra region of Gujarat.

The factors affecting productivity are of paramount importance to agricultural economy. Reproductive efficiency is main factor influencing productivity which hampered in the female buffalo by inherent late maturity, distinct seasonal reproductive pattern and prolonged inter-calving intervals (Madan and Raina, 1984). Better understanding of the cellular differences in relation to the functions that occur in the female reproductive tract, particularly in the oviduct, throughout the stages of estrous cycle in buffaloes is primarily required to improve the buffalo reproduction (Tienthai et al., 2008).

The incidence of the total reproductive tract disorders reached 46 % of the examined slaughtered buffaloes. The pathological abnormalities of the uterine tube and ovarian bursa represented 17.30 % of these disorders, which reflection of the importance of the uterine tube in the reproductive cycle of the animal under investigation (Helal et al., 2015).

The uterine tube is not a simple passage for transport of ova and sperm only. It possesses several important functions such as, it captures the ova released from the ovary and conveys them toward the uterus. It also conveys the sperms in their ascent for fertilization which occurs normally in the ampulla of the tube (Hafez and Hafez, 2000).

Isthmus and uterotubal junction of the bovine uterine tube involved in events of sperm transport; storage and capacitating that were needed for preservation of motility, viability and fertilizing ability of spermatozoa. Moreover, the bovine tubal fluid contained certain proteins and glycoproteins which were potential in sperm capacitation as well as the nourishment of the ovulated ova and the developing embryo. The mammalian oviductal epithelium consisted of two morphologically
distinct types of cells, ciliated and non-ciliated. The non-ciliated cells released the secretory proteins and glycoproteins materials into the lumen and their secretions formed the oviductal fluid. The ciliated cells played an important role in the transport of oocyte into the oviduct in mammals (Helal et al., 2015).

Oviducts are paired convoluted tubes extending from ovaries to the uterus. These tubes are about 17 to 26 cm long and 2.0 to 3.0 mm in diameter in Murrah buffalo which makes them difficult to palpate on rectal examination (Sohi and Saigal, 1997). The oviduct may be divided into four functional segments: the fringe-like fimbriae; the funnel-shaped abdominal opening near the ovary, the infundibulum; the more distal dilated, major portion of the uterine tube from the infundibulum to the isthmus is called the ampulla; and the narrow proximal portion of the oviduct connecting the oviduct with the uterine lumen, the isthmus (Arthur et al., 1996).

The oviduct undergoes marked morphological and functional changes during the estrus cycle (Bauersachs et al., 2004). The oviductal mucosa is made up of primary, secondary and tertiary folds. The mucosa in the ampulla is thrown into high, branched folds that decrease in height toward the isthmus and become low ridges in the uterotubal junction. The complex arrangement of these mucosal folds in the ampulla almost completely fills the lumen so that there remains only a potential space (Rajesh et al., 1997). The ciliated cells of the oviductal mucosa have slender motile cilia that extend into the lumen. The percentage of ciliated cells decrease gradually in the ampulla toward the isthmus and reach a maximum in the fimbriae and infundibulum. Ciliated cells are noted in large numbers at the apices of the mucosal folds (Hafez and Hafez, 2000). The secretory cells of the oviductal mucosa are non-ciliated and characteristically contain secretory granules, the size and number of which vary widely among species and during different phases of the estrous cycle (Banks, 1993).

In all mammals, the endometrium of the uterine horns plays a critical role in normal fertility and also represents different features in order to adapt through various phases of oestrus cycle. The uterus not only has an influence on ovarian structure but also can participate in different physiological events by producing uterine milk. Therefore, it can provide an appropriate environment for sperms and/or it can accommodate a vital nutritional condition for blastocyst. Finally, the implantation process can be done completely (Shahrooz et al., 2013). Generally, the most important function of the uterine horns in ruminant is involved in sperm transport,
implantation, pregnancy and parturition in associated with adjustment of cellular structures and microenvironments (Barnes, 2000).

Uterus and uterine horn of the mammals consists of three different layers including: endometrium, myometrium and perimetrium (Mescher, 2013). The endometrium is comprised of two functional and basic layers. During estrus cycle, the functional layer of the endometrium undergoes specific molecular, enzymatic, morphological, and structural changes, which are under control of ovarian hormonal changes (Eurell and Frappier, 2006).

To better understand the basic structure and physiology of the buffalo oviduct and uterus, more information is needed regarding the differences between the segments associated with the stages of estrous cycle. Therefore, the aim of the present study is to investigate the histological histochemical and scanning electron microscopic approaches in the oviduct and uterus of Jaffarabadi buffalo at the follicular and luteal phases of estrous cycle.

While, reviewing the available literature there is a lack of information on the above research topic. Hence, this work was planned to throw more light on the various aspects of the morphology of the uterine tube and uterus in Jaffarabadi buffalo, using modern techniques as a trial in solving some problems of infertility and to play a part in increasing the animal production and national income with the following objectives:

1. To study the histomorphological changes in oviduct and uterus of Jaffarabadi buffaloes during follicular and luteal phases.
2. To study the distribution of various histochemical moieties in the oviduct and uterus of Jaffarabadi buffaloes during follicular and luteal phases.
3. To study scanning electron microscopic structure of oviduct and uterus in follicular and luteal phases.