1. INTRODUCTION:

Water is the prime natural resource, a basic human need and a precious national asset. Water is most stable compound and universal solvent. It is one of the most priceless gifts of nature. Today, water resources have been exploited due to increasing population, industrialization, urbanization, increasing living standards and broad spheres of human activities. The quality of water is of vital concern for mankind since it is directly linked with human welfare. The water is used for domestic purpose, for industrial applications as well as for agricultural practices.

Of the total amount of global water, only 2-4 % is distributed on the main land, of which only a small portion can be utilized as freshwater. The available fresh water to man is hardly 0.3-0.5 % of the total water available on the earth and therefore, its judicious use is imperative (Hegde and Kale 1995). The fresh water is a finite and limited resource. The utilization of water from ages has led to its overexploitation coupled with the growing population along with improved standard of living as a consequence of technological innovations (Todd 1995, Indra Raj 2000).

70 % of population in India lives on agriculture for livelihood. Since, water is the prime resource for agriculture, the need for conservation of such resource is much more relevant when water is becoming a scarce material as the development progresses. Effective conservation of water can be achieved by better water management practices and by adopting suitable cropping pattern duly considering the climatic and soil conditions. It permits better utilization of the other production factors and thus leads not only to increase yield per unit of land and time but also stability in the economic conditions of farmers. Recognizing this fact, considerable efforts have been made in India to develop both surface and ground water resources. The most important developmental activity, which can spread its benefits to our large rural population and promote all around economical growth in the
countryside is proper planning, development and management of the existing water resources for effective irrigation and sustainable production.

The Indian sub continent spans the latitude ranges from 6°N to 37°N. This region is part of humid tropics; some areas are dry and almost arid. Most of the region shows lentic and lotic habitats. Natural lakes are though notable for their scarcity only a few occurring in northern most region. However, man made lakes are quite numerous.

Water is one of the major natural resource and only the availability of the resource is not sufficient. On the other hand this resource should be clean, free from all the anthropogenic effects and its use should be sustainable.

Gathering of data on the basic parameters of water is very much useful in management plans. Present work covers the evaluation of six different wetlands with respect to wetland features, water quality, wetland productivity, anthropogenic threats and overall importance of wetlands in agricultural and fishery resources. Therefore, present piece of work represents the baseline for sustainability, management and conservation of wetland ecosystem of Sangli district.

Suitable use of wetland resources provides both long term functions and values from these systems and economic benefits. Wetlands provide much value to human that are not paid and are usually much more valuable than the mere piece of land or the immediate products harvested. The wetlands are very important in providing biological diversity in terms of crops, fishery etc. Sustainable development is not possible without proper management of wetlands.

Ecologically, wetlands are important ecotones which are transitional between open waters and land endowed with definite structural and functional attributes and performing specific ecological roles. Wetlands are water saturated or submerged areas which include both natural and man
made, permanent or temporary, fresh water or marine water habitats (Nair 1989).

During past twenty years there has been a great surge of interest in this ecosystem on account of the realization and demonstration of its significant role in biological productivity (Leith and Whittakar 1975), flood control (Novitzki 1979), regulation of aquifers (Carter et. al.1979), regulation of water quality (Larson 1982), treatment of waste waters (Kadlec 1978), secondary production and wild life (Turner 1982) and erosion control (Dean 1979).

The wetlands occur in almost all climatic regions ranging from the frozen, glaciated north to the burning, tropics and they differ widely in their biotic and abiotic structure. Furthermore, new wetlands emerged in arid regions through human activities, in other area. Natural wetlands are rapidly transforming through draining and filling to satisfy the ever-increasing demands for residential and industrial complexes. The consequences of such activities have not been subjected to any ecological assessment of scientific scouting. Some information is available from temperate and subtropical areas. But the information is fragmentary.

Interest on Indian wetlands has been comparatively recent and information available is meager, fragmentary and inadequate even for broad generalization. Very little is known about their distribution extent, status and management needs.

Therefore, it is essential to have a good definition as an essential prerequisite for any consideration of this ecosystem.

Wetlands have been defined in several different ways depending upon the situation to include a wide spectrum of habitats.

Thus, IUCN (1971) gives a very comprehensive definition which virtually covers marshes, swamps, bogs, peats, rivers, lakes, reservoirs and coastal areas as follows. ‘Submerged or water saturated lands both natural and man made, permanent or temporary, with water that is static or flowing,
fresh, brackish or salt, including areas of marine water, the depth of which at low tide does not exceed six meters’.

The Ramsar convention (1971) defines wetland as, “area of marshes, fens, peat lands or water whether natural or artificial, permanent or temporary with water that is static or flowing, fresh, brackish or salt, including area of marine water which at low tide does not exceed six meters.”

The wetlands are lands transitional between terrestrial and an aquatic system where the water table is usually at or near the surface or the land is covered by shallow water.

According to Cowrdin et. al. (1979), the wetlands are suitable habitats for variety of animals, birds and many aquatic plant forms, which form a typical food chain, food web and all responsible for several biological products. These fresh water ecosystems are very important in relation to their biological and ecological function.

According to National Research Council 1995b (NAS 1995) wetland as an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical and biological features of recurrent sustained inundation or saturation.

Wetlands are the lands on which water covers the soil or is present either at or near the surface of the soil or within the root zone, all year or for varying periods of time during the year. Wetlands can be identified by the presence of these plants (hydrophytes) that are adapted to life in the soils that form under flooded or saturated conditions (hydric soils) characteristic of wetlands (NAS 1995, Mitsh and Gosselink 1993).

As per the definition from the 1987 U. S. Army Corps of Engineers (USCOE) wetlands are those areas that are inundated or saturated or ground
water at a frequency and duration sufficient to support a prevalence of vegetation adapted for life in saturated soil conditions.

According to the U. S. Department of Agriculture (USDA) National Food Security Act Manual (1988) Wetlands are lands that i) have a predominance of hydric soil; ii) are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support a prevalence of hydrophytic vegetation typically adopted for life in saturated soil conditions, and iii) under normal circumstances do support a prevalence of hydrophytic vegetation.

Wetlands are often treated as seral communities which would readily shift to terrestrial communities. The structure of wetland community is held in delicate balance by its hydrological environment. Any activity that directly or indirectly impinges upon the hydrology of system disturbs the whole system. Thus drainage, diversion of water flow, increased inflow of silt or nutrient enrichment are all responsible for a shift in the structure and function of the wetlands (Gopal Brij 1986).

Directory of wetlands published by Ministry of Environment and forests (1990), Government of India includes only 12 districts out of 31, for information on man made wetlands. The list includes about 44 manmade wetlands. All of them are fresh water bodies. Both lentic and lotic water ecosystems contribute a great fraction towards the availability of water resources on the earth surface. Increased human activities over the recent past years are imposing a greater stress on these ecosystems, resulting in changing their characteristics.

The analysis of various physico-chemical parameters of an aquatic ecosystem is very much essential to know their status.

Wetlands are invaluable resources and the continued degradation and loss involves numerous direct and indirect consequences at many dimensions of society. The future of wetlands has become global issue in need of global information sharing co-operation, policy setting and action.
Although 6% of the world's land surface is wetland. These wetlands contribute a far greater percentage to the world's overall biological productivity and water resources functions. These include food production, fisheries, food storage, pollution control, recreation and overall biological diversity.

Agricultural productivity is a complex phenomenon related to favorable physical, socio-economic and technological factors. It is expressed in terms of output from arable land or output per unit of input. It is also a measure of agricultural efficiency depending upon the man made framework to exploit the reservoirs. The availability and supply of water through different modes of irrigation is the key factor in determining the agricultural productivity in general and dry land zone in particular.

Attempts are made to collect more information and update the biological data of untouched water bodies which will be of use in studying and conserving the water resources of our country.

The work is initiated during 2005. During this study, the reservoirs from Tasgaon taluka were evaluated with respect to agricultural productivity and fishery resources. It was observed that these wetlands have become life supporting for local inhabitants in terms of increase in agricultural fields and crops as well as availability of water throughout the year (Sathe et al. 2006). Therefore, attempts were made to know some of the major wetlands from the drought prone region of Sangli district. Attempts have been made to know the significant role in social and financial upliftment of local inhabitants with special reference to agricultural and fishery.

The study has been designed to understand the hydrobiological features of reservoir, to assess water quality which will state the potability, suitability for fish culture and irrigation purpose.

Prior to initiation of present work all the wetlands were surveyed to know their extent and seasonality. Some are small area wise while, some of
them dry up during summer. Therefore, area wise six major perennial wetlands were selected.

The main objective of the work is to study the existing cropping patterns and available water resources in the study area, to identify suitable sites which will meet the requirement of water for existing crops and to recommend suitable pattern.