INTRODUCTION
Rice (*Oryza sativa* L.) occupies the enviable prime place among the food crops cultivated around the world and is the staple food of one third population of the world. It is grown in 152 million hectare with a production of 593 million tonnes and an average productivity of 3.91 t/ha (Rai, 2004) The south and southeast Asia is the center of origin of genetic diversity of the Asian cultivated rice (*Oryza sativa* L.). In Asia, rice is grown on 136 million hectare with a production of 539.8 million tones and productivity is 2.97 t/ha (Rai, 2004). Rice occupies a pivotal place in Indian agriculture, as it is the staple food for more than 70 per cent of our population and a source of livelihood for about 150 million households. It accounts for about 43 per cent of the total food grain and 55 per cent of cereals production in the country (Pandey *et al.*, 2000).

In India rice is cultivated round the year in one or the other part of the country in diverse ecology spread over 44 million hectares with a production of 93.3 million tonnes representing the largest in area and the second highest producer in the world with an average productivity of 2.08 t/ha (Rai, 2006). In northeastern region of India, rice is the most important food crop. In this region, it is widely grown as an upland (in the plains), *jhun* (shifting cultivation)
and lowland (in the valleys). The northeastern hills include the eastern Himalaya, Sikkim, Arunachal Pradesh and the Arakan ranges. The vast area of hills interspread with fertile valley represents agro-climate of unique diversity ranging from extreme temperate to tropical falling within altitude range of 50 to 5000 m and above. The region is characterized by high rainfall (2032 mm to 10700 mm) and high humidity (80-90 %). Rice is an important cereal crop covering an area 3.51 million hectare producing 5.50 million tonnes with average productivity of 1.57 t/ha, which is much below the national average of 2.08 t/ha. (Pattanayak et al., 2006). The North Eastern Hill (NEH) region presents most diverse condition for rice growing in terms of slopes, altitudes, agro-climate and soil-type etc. The widely diverse agro-climatic conditions along with other physiographic factors have led to immense variability among rice cultivars. Selection made unknowingly by various ethnic groups inhabiting different altitudes and climatic situations, practicing different forms of cultivation might have also contributed to the diversity of rice crop in this region (Sarma et al., 1988).

Rice land races nurtured by farmers for generation have an inherent genetic value because of their adaptation to different farming conditions and resistance to pests and diseases. Knowledge about these traits, their genetic and molecular control and stability under different conditions enhances the value of conserved germplasm. Over several decades, breeders have systematically characterized the germplasm collection for a range of morphological and
agronomical traits that facilitate conservation, as well as selection of suitable phenotypes (Jackson et al., 1996).

Landraces though, in general yield low, possess high yield stability, which is important for subsistence farming. Genetic diversity probably serves as insurance against crop failure. The landraces may be regarded as natural composite varieties that have an array of resistance genes and are well buffered so that no single race or biotype can attack at an epidemic level. (Subba Rao et al., 2001)

Although over the past 20 years there has been a significant increase in the use of landraces in rice breeding from the large number of rice accessions at International Rice Research Institute (IRRI), Manilla and other gene banks, the use of conserved germplasm for breeding is still rather limited. The use of landraces and wild species in rice breeding has had an enormous impact on rice productivity in many countries. For example one accession of wild species Oryza nivara (IRGC – 101508) was used to introduce resistance to grassy stunt virus into cultivated rice which led to the release of IR 36. This variety has 15 landraces in its pedigree (Plucknett et al., 1987) and at one point of time was planted on more than 11 million hectare making it the world’s most widely cultivated cereal crop variety (Swaminathan, 1982). New hybrid between Oryza sativa and many wild species have been achieved through the use of various biotechnological and breeding tools (Khush et al., 1993). Economic
value of rice germplasm collection for rice improvement has also been assessed (Evenson and Gollin, 1994).

The availability of a wide gene pool in the form of genetic diversity is a prerequisite for crop improvement. Vavilov (1951) was the first to show the importance of genetic variability in crop improvement and developed a systematic plan of action for collecting genetic materials from primary centers of origin of crop plants and also explained the relationship between genetic diversity and center of origin. Since genetic diversity is used mainly by plant breeders, the issue related to collection and conservation were primarily of interest to plant collectors and conservationists. However, after World War II, the threat of genetic erosion due to destruction of habitats where genetic variability exists, led to the growing concern and subsequently concerted efforts for both in situ (biosphere) and ex situ (gene bank) conservation were made (Sarma et al., 2000).

Germplasm resources not only help in avoiding genetic vulnerability due to pest and disease but also help in the advancement made in the molecular biology and genetic engineering in transferring useful genes across sexual barrier (Swaminathan, 1989). Biological diversity has been identified as a primary factor of production, essential for sustenance and enhancement of crop improvement. Plant breeders’ efforts towards crop improvement by way of identification and incorporation of traits from within the available gene pool has been at 8 % per annum in case of rice. Nearly 70 % of the new varieties
of hybrids that were developed had specific contribution from their wild/local ancestors. So are the cases of crop reinstatement in case of epidemic spell of disease. This not only highlights the significance of landraces and local varieties, but also stresses the need for effective conservation of genetic resources for posterity (Sudha and Rajsekharan, 2001).

Rice is one of the important staple foods of human being and a large number of rice germplasm are disappearing (landraces, wild rice and traditional varieties) due to introduction and spread of high yielding varieties (HYVs), which is narrowing the genetic base. Collection and conservation of rice germplasm is not only important for utilization of desirable attributes in breeding programmes but is also essential for protecting genetic wealth and is a means to safeguard the crop against vulnerability to attacks by diseases and insects which has become more important with the increase in genetic uniformity among cultivars.

The tribal inhabited belt is more often the center of domestication and genetic diversity of food crops, being maintained by peasants and subsistence farmers. These areas hold unique and important genetic materials, which should be identified, collected, characterized and properly documented. The genetic diversities of heirloom varieties are held by the tribes in their dooryard garden, Baris (land attached to their houses and huts), kitchen gardens and in fields. The primitive cultivars including the wild species grown by farmers are valuable sources of genetic material for modern plant breeder.
Germplasm collection, evaluation and utilization played a key role in rice varietal improvement. Realizing the importance of genetic conservation, Consultative Group on International Agriculture Research (CGIAR) established an International Board of Plant Genetic Resources (IBPGR) in 1974 for promoting co-ordinated efforts in collection. Rice germplasm collection was initiated in between 1910 and 1920. At present, National Bureau of Plant Genetic Resources (NBPGR), New Delhi is coordinating the exploration and collection of rice germplasm in India and also supporting operational facilities for the explorations. In 1984, a Division of Genetic Resources was established in Central Rice Research Institute (CRRI) to look after all the aspect of rice germplasm. With the introduction of a mission mode National Agriculture Technology Project (NATP) on Sustainable Management of Plant Biodiversity a new thrust was given to exploration and collection of crop germplasm with special reference to wild rice.

Plant genetic resources represent the sum total of diversity accumulated through years of evolution under domestication and natural selection (Mehra and Arora, 1982). Cultivation and farmer’s selection for centuries under varied growing conditions has resulted in a myriad of rice varieties. It is estimated that after removing duplication, about 1,20,000 distinct rice varieties exist in the world. Approximately, 80,000 accession of cultivated and 3000 accession of wild species are preserved in IRRI, Philippines (Rao et al., 2001). Now the total number of rice accessions maintained by various Research Stations in India
might exceed 80,000 (Singh et al., 2001). The northeastern region of India being a center of diversity for rice landraces show the distinctness among the germplasm that has been collected so far. The rice collection in North-Eastern states of India which are supposed to be nearer to the center of origin of rice, resulted in a collection of 6700 local cultivars and landraces designated as Assam Rice Collections (Sharma et al., 1971).

Collection and conservation of valuable germplasm is not only important for utilizing the appropriate attributes as best donors in breeding programmes but also is essential to protect the area so that enormous genetic wealth could be preserved. Systematic study and characterization of germplasm is of great importance for current and further agronomic and genetic improvement of the rice crop. The systematic characterization or evaluation of rice germplasm of northeast India will provide an array of information on various parameters of indigenous landraces of rice. The knowledge of genetics of various morphological characteristics improving biomass/grain yield in rice is also associated to choose the parameters on rational basis for hybridization. In view of the above, the present investigation was aimed with the following objectives:

1) To collect and maintain the germplasm.

2) To characterize the germplasm lines for quantitative and qualitative characters and also for biotic stress.

3) To study the variability in the germplasm collection.
4) To estimate the interrelationships among different yield and yield components and their influence on yield through correlation and path analysis.

5) To assess the genetic divergence between the population.

6) To identify the materials having desirable attribute for selection and utilization in future breeding programmes.