National seminar on
Biological diversity and adaptation across different ecozones

India, a land of vast human diversity consists of more than four and a half thousand anthropologically well-defined populations. Archaeological evidence suggests that human habitation in Indian subcontinent began from Early Stone Age dating 250,000 YBP. People from different ethnic stock, culture and languages started migrating to India from different directions and contributed significantly to the present day gene pool. Also, the varied ecological regime of the country nurtured this diversity and bears testament to human's adaptability to an array of environmental conditions.

Ever since the first appearance of genus *Homo* to the emergence of the species *sapiens* we see a continuation and elaboration of adaptive pattern which enhance survival in the changing environment. The term 'adaptability' is often interpreted to encompass only the responses in the phenotype, emerging by the action of environment upon a given gene system. At the same time, 'human adaptability' is applied to response which improves function of an individual or population in an environment. It discerns genetic adaptation as specific inheritable characteristic which favors tolerance and survival of the organisms in a particular environment.

Before World War II, most studies of human variation focused on visible phenotypic variation between large and geographically defined populations. These phenotypic traits included skin colour, hair colour, hair form, eye colour, shape of the face and nose. Since World War II, the emphasis shifted from simply describing human diversity to understanding the casual processes for variation. Biologist examined the differences in allele frequencies within and between populations, as well as considering the adaptive significance of phenotypic and genotypic variation. Also, the respective contribution of genetic and environmental factors vary with the developmental stage of the organism- the earlier the stage, the greater the influence of the environment and greater the plasticity of organism.

Today human biologists have many different specialities – molecular genetics, international health, environmental physiology, growth and development, nutrition, evolution – but a common perspective; the understanding of the causes and consequences of 'natural' variability of *Homo Sapiens*. However, it is impossible to understand human variation without considering human behaviour and culture which shape the human biology. Surviving in this immense diversity of habitats depended not on specific genetic adaptations, but on large bodies of culturally transmitted know-how, abilities, and skills. We are an ultra-cultural species —unlike any other—whose brains,

genes, and biology have long been shaped by the interaction between cultural and genetic evolution. Thus, human can't be understood simply as biological or simply as cultural being - bio-cultural viewpoint play a prominent role in understanding human biological diversity.

Since the habitation, much of the environmental stress with which human dealt were result of modification of their immediate environment which resulted in diverse ecological deviation from natural setting. Also globalization and urbanization has modified human lifestyle and come with risk factors that threaten the lives of individuals. Concerned by the shift in demographic structure and consequences of changing lifestyle, it is important to identify the crucial stages in which environmental conditions shift and common modifiable risk factors emerge.

So our understanding of human variation will continue to change as we learn more about the diversity and also the uniformity of our species. It falls to anthropologists and biologists to continue exploring the issue so that, to the best of our abilities, accurate information about human variation is available to anyone who seeks informed explanations of complex phenomena.