FAQ's

What is bioinformatics?

Bioinformatics is an interdisciplinary field that develops methods and software tools for understanding biological data. As an interdisciplinary field of science, bioinformatics combines computer science, statistics, mathematics, and engineering to analyze and interpret biological data. Bioinformatics has been used for *in silico* analyses of biological queries using mathematical and statistical techniques.

Bioinformatics is both an umbrella term for the body of biological studies that use computer programming as part of their methodology, as well as a reference to specific analysis "pipelines" that are repeatedly used, particularly in the field of genomics. Common uses of bioinformatics include the identification of candidate genes and nucleotides (SNPs). Often, such identification is made with the aim of better understanding the genetic basis of disease, unique adaptations, desirable properties (esp. in agricultural species), or differences between populations. In a less formal way, bioinformatics also tries to understand the organisational principles within nucleic acid and protein sequences.

What economic incentives can be provided to aid in conservation of bio diversity?

Incentive mechanisms are increasingly being tried out in developing countries to address the conservation of biodiversity and provision of ecosystem services – that is services that ecosystems provide. Examples of incentives include:

- payments for environmental service schemes, in which natural resource users are paid to conserve natural resources or manage them more sustainably. Read a briefing on marine and coastal ecosystem services.

- conservation enterprise and certification of 'biodiversity-friendly products', the production of which conserves key species and habitats while improving the livelihoods of people
- ecotourism that is either community-based, or involves benefit-sharing to give local communities a stake in conserving critical habitats and species. Read about a completed project in Srepok Wilderness Area, Cambodia.

These mechanisms have mostly concentrated on creating incentives for biodiversity conservation rather than compensating those affected by biodiversity loss. But interest is also growing in 'biodiversity offsets' which seek to compensate communities for the unavoidable negative impacts of development projects on biodiversity at one site, for example from establishing a mine or building a road, through conservation actions aimed at restoring or reducing threats to biodiversity at another site.

With all types of incentive and compensation mechanisms the rules governing their operation will be critical for determining their social impact, in particular in determining who participates, who benefits and who loses out. In some cases the rules will be locally determined but in others, such as REDD+, a scheme to reduce carbon emissions from forest loss or degradation, the rules agreed at the international level will set the framework for further rule-setting at the national level. A better understanding of the social implications of the rules set at international, and/or national and local levels in order to better design these mechanisms in future is needed.

Define: a) Captive breeding b) Umbrella Species

Captive breeding is the process of breeding animals in controlled environments within well-defined settings, such as wildlife reserves, zoos and other commercial and noncommercial conservation facilities. Sometimes the process includes the release of individual organisms to the

wild, when there is sufficient natural habitat to support new individuals or when the threat to the species in the wild is lessened. Captive breeding programs facilitate biodiversity and may save species from extinction. Release programs have the potential for diluting genetic diversity and fitness.

Umbrella species are species selected for making conservation-related decisions, typically because protecting these species indirectly protects the many other species that make up the ecological community of its habitat. Species conservation can be subjective because it is hard to determine the status of many species. With millions of species of concern, the identification of selected *keystone species*, *flagship species* or *umbrella species* makes conservation decisions easier. Umbrella species can be used to help select the locations of potential reserves, find the minimum size of these conservation areas or reserves, and to determine the composition, structure and processes of ecosystems.

Discuss the work of Project Tiger.

Project Tiger is a conservation programme launched in 1973 by the Government of India during Prime MinisterIndira Gandhi's tenure. The project aims at ensuring a viable population of Bengal tigers in their natural habitats and also to protect them from extinction, and preserving areas of biological importance as a natural heritage forever represented as close as possible the diversity of animals across the tiger's distribution in the country. The project's task force visualized these tiger reserves as breeding nuclei, from which surplus animals would migrate to adjacent forests. The Funds and commitment were mastered to support the intensive program of habitat protection and rehabilitation under the project.The government has also set up a Tiger Protection Force to combat (poachers) and funded relocation of villagers to minimize human-tiger conflicts. It has been supported by various organizations.

During the tiger census of 2006, a new methodology was used extrapolating site-specific densities of tigers, their co-predators and prey derived from camera trap and sign surveys using GIS. Based on the result of these surveys, the total tiger population has been estimated at 1,411 individuals ranging from 1,165 to 1,657 adult and sub-adult tigers of more than 1.5 years of age.Owing to the project, the number of tigers has improved to 2,226 as per the latest census report released on 20 January 2015