

A diagnostic study of onset and withdrawal of summer monsoon in Nepal, 2003

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ABSTRACT:

Rainfall influences Nepal's major socio-economy sector such as agriculture, on which more than 80% people rely for their livelihood. The monsoon season (June- Sep) is the rainy season in Nepal, which accounts for about 80% of annual rainfall to the country. Analyses and monitoring of year to year monsoon activities are essential for timely forecast of onset and withdrawal of monsoon as well as the characteristics of monsoon. This paper discusses delay in the onset and retreat of monsoon 2003 with the help of synoptic charts and satellite imageries. In this study, data from 16 stations over Nepal are used to investigate and understand the seasonal variability.

Key Words: Rainfall, trough, blocking high, mid and upper troposphere.

1. INTRODUCTION

Agriculture activities and river flows of Nepal are influenced by monsoon rainfall, which in turn influence of economy of country. The monsoon season (June through September) is the main rainy season and accounts for about 80% of the annual rainfall of the country. It is observed that monsoon rainfall amount during the last 30 years does not show any significant trend but has considerable year to year variations resulting in an number off droughts/floods events. Inter-annual variation of monsoon rainfall has many social and economic impacts. A year of deficient rainfall can bring great hardship to the large population and cause severe strain on the economy of the country.

The arrival and withdrawal of the monsoon season are very important for agriculture. Rice is the most important crop in Nepal, predominantly based on monsoon rain. Preparation of land for planting, time of rice planting and the time of harvesting are determined by the arrival and withdrawal periods of the monsoon. The arrival and withdrawal dates of monsoon in Nepal also vary from year to year. Improvement in the understanding of the monsoon, especially, in the prediction of the arrival and withdrawal dates of monsoon is essential.

2. DATA AND METHODS

Synoptic charts of upper air and surface, from June through to September of the year 2003 and climatological records were obtained from Department of Hydrology and Meteorology (DHM). Satellite imageries of visual and infrared (IR) bands, along with some significant counter charts were obtained from different international institutes. Synoptic charts of surface and 8 levels of upper air have been reanalyzed and compared with the National Centre of Medium Range Weather Forecast (NCMRWF, India) product charts for matching dates. Satellite imageries derived from Dundee Satellite Receiving Station (UK) were also used to investigate the movement of the systems, their persistency and intensity. Both visual and infrared satellite imageries were analyzed.

3. ANALYSIS

3.1 ADVANCEMENT AND ONSET OF MONSOON

According to India Meteorological Department (IMD) bulletin issued at 3rd Oct 2003, the south-west monsoon entered the south Arabian Sea on