SEDIMENTOLOGY OF THE LOI-AN GROUP IN THE WESTERN MARGIN OF THE SHAN PLATEAU, THAZI AND KALAW TOWNSHIPS

PhD DISSERTATION

ME ME THEIN

DEPARTMENT OF GEOLOGY
UNIVERSITY OF YANGON
MYANMAR

MAY, 2011

ABSTRACT

The present study area covers the easternmost part of the Thazi Township and westernmost part of the Kalaw Township. The present work attempts to make a detailed sedimentary facies analysis to deduce the sequential evolution of the Loi-an Group using the sequence stratigraphic concepts.

The Loi-an Group conformably underlies the red beds of the Taungni Formation (Lower Cretaceous) and unconformably underlies the Kalaw Group (Upper Cretaceous) and unconformably overlies the Lebyin Group (Carboniferous-Permian) and the Plateau Limestone (Permian-Triassic).

The previous workers have adopted different stratigraphic names for various formations in the Loi-an Group. In the present work, the Loi-an Group is treated as two broad sedimentological divisions, the lower turbiditic division and the upper non-turbiditic division, according to the sedimentary facies associations recognized.

Modal analysis on the sandstone provides a characteristic feldspathic lithic arenite (Q_{66}-F_6-L_{28}) for the sandstones of the lower turbiditic division and quartz arenite (Q_{92}-F_1-L_7) for the sandstones of the upper non-turbiditic division. Minor carbonate rock types of the lower turbiditic division are argillaceous limestones, bioclastic limestones and dolostone.

In the lower turbiditic division, seven major clastic facies are recognized and grouped into three facies associations. The seven major clastic facies recognized are massive, thick-bedded sandstone facies, thinly interbedded sandstone-shale facies, horizontal and low-angle planar laminated sandstone facies, medium to thick-bedded sandstone with crude cross-bedding facies, mudstone facies, thinly interlayered sandstone-marls facies and marls facies. The three facies associations are upper fan facies association, middle fan facies association and lower fan facies associations. These facies associations are assigned to the delta-fed submarine fan system.

Carbonate rocks are classified into seven microfacies. They are lime mudstone facies, bioclastic mudstone facies, bioclastic peloidal grainstone facies, bioclastic packstone-grainstone facies, intraclastic wackestone-packstone facies, bioclastic pelletal

grainstone facies and dolostone facies. They are interpreted to have been deposited in the peritidal environment ranging from subtidal to supratidal areas.

In the upper non-turbiditic division, a total of five major clastic facies is recognized. They are sandstone interlayered with shale partings facies, carbonaceous shale facies, cross-bedded (small-scale) sandstone facies, thinly interbedded sandstone-mudstone facies and thick-bedded mudstone facies. They are grouped into three facies associatons, namely, distributary channel facies association, interdistributary bay (or) marsh facies association and overbank facies association. The depositional environment is interpreted as a delta-plain environment.

The turbiditic sequence is divisible into three system tracts, viz., lowstand system tract, transgressive system tract and highstand system tract. The maximum flooding zone is noted between the transgressive system tract and the overlying highstand system tract as indicated by the occurrence of a bioturbated horizon and phosphate minerals in the sandstones of this zone. The non-turbiditic sequence is divided into late transgressive system tract and early/late highstand system tract. Coal seam in this sequence may represent a flooding surface of a delta system.

The sedimentology and sequence stratigraphy indicate that the Loi-an Group represents a delta-fed submarine fan deposit that shallows up into deltaic deposits. The depositional system of the Loi-an Group is interpreted to be a transition from the delta – fed submarine fan deposition of the lower turbiditic division at the mouth of the shelf-marginal area through the intraslope and coastal marginal deltaic deposits of the upper non-turbiditic division in response to relative sea-level changes.

CONTENTS