

**Key note Speech****What we are facing in the Mekong River Delta: Dual or multiple threats and opportunities to overcome****Le Xuan Thuyen**

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**Abstract**

The Mekong River Delta is well known as big rice bowl and fish stock for more than 20 million of people. However, there occurred serious problems during the last few decades such as deadly floods (2000 and 2011), bank collapses along the rivers, land loss and encroachment on the coastline, intense intrusion of saline water, extreme drought and water shortage (2015-2016). This paper concerns multiple threats in the Mekong River Delta - what are going on now, what will be in the future. Especially on the widespread consequences of irreversible and long-term process are discussed in the context of current global warming.

As all modern deltas - relatively young and unstable landforms, the Mekong River delta is formed by the accumulation of sediments derived from its catchment area. Unfortunately, its fate is exposed to the risk of sediment starvation caused by the dams constructed in Mekong catchment area and also to the risk of sea level rising. Moreover, land sinking due to self-compaction

occurring inside of substrate and underground water extraction makes the situation become worse.

Based on the research results of Mekong delta subsidence monitoring network (since 2010), it is demonstrated that shallow subsidence is a main factor that conducting a high effective sea level rise, which is few times greater than the mean rate of normal geostatic sea level rise. In reality, the greatest values 3-4 cm/year of shallow subsidence are observed particularly under mangrove forest at some parts of coastal zone, which is in contrast to the landward value of around 1 cm/year. In consequence the low-lying land could be submerged completely and faster than the rate estimated in National Report "Scenarios of climate change and sea level rise for Vietnam". Our results of pairwise monitoring demonstrate also a positive role of mangrove roots to weaken the land sinking rate.

On the other side, the human activities impose locally a lot of serious impacts to the nature. The constructions of polder embankment for rice cultivation induce a series of consequence. Soil contamination by pesticide under intensive rice cultivation (7crops/2 years) in flood free land is clearly higher than that in regions of new alluvium entering and renewing soil fertility during annual flood.

Coming back to the question of land subsidence in the Mekong River Delta, although we did much research efforts, however there still remain a lot of problems to investigate such as shallow gas emission, reduction of new alluvium entering inside the polder embankment to compensate land sinking, occurrence of mega-drought and corresponding underground water extraction. These are all slowly-varying processes and it is needed to do a long-term monitoring. Although some approaches of integrated management of the rivers is suggested in order to slow down these processes, land sinking is an unstoppable process occurring globally in all modern deltas. Hence, we may learn something from individual efforts in diverse local practices and share the lessons between people who are suffering the same problem. That is one of reasons the subsidence monitoring network is extending progressively in the big deltas in South East Asia region, i.e., Red River delta and Mekong delta (Vietnam), Chaophraya delta (Thailand), and Irrawaddy delta (Myanmar).

**Keywords:** Mekong delta, shallow subsidence monitoring, threats, integrated management