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Towards an Integrated Fire Management Framework using Space-based Application in Asia and The Pacific

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The integrated fire management framework using space-based application has been developed to reduce the consequences of fire disaster, particularly in developing countries, least developed countries (LDCs), small island developing states (SIDs) and land-locked developing countries (LLDCs) in Asia and The Pacific. Since 1982/ 1983 and 1997/1998, the two recorded forest fires in the world created much suffering in Asia and The Pacific region, while the resulting transboundary atmospheric pollutant and increasing CO2 emissions contribute to global warming. Fire disasters continue to frequently occur. Therefore the framework to strengthen the effective production and utilization of space information products and services for integrated fire management is much needed. The framework in the study consists of: (1) intensifying risk identification; (2) enhancing risk processing; (3) strengthening risk information transfer, evaluation, and reduction; and (4) promoting regional and international cooperation. The complex framework is derived from lessons learned from grassland and forest fires that severely hit countries in Asia and The Pacific, namely The Russian Federation, Kazakhstan, China, Mongolia, India, Nepal, Indonesia, Thailand, and Australia. Season for fires in studied countries shows the resumption of the fire season in Asia and Pacific countries which occurred frequently, 70% in post-monsoon and 40% in pre-monsoon with lag interval about 2-3 months or half a year after the Multivariate ENSO Index (MEI). The percentage of fire occurrence is more than 100% due to the double peak season in some countries with large land masses The Russian Federation, Indonesia, China, Mongolia and India. The total estimation of CO2 emissions from representative studied countries during the period 1980-1989 were dominant by the Southeast Asia sub-region, especially from Indonesia and Thailand estimated equivalent to 1,831.58 Mt CO2, while the period 1990-1999 accounted the most emitter to Mongolia in East Asia sub-region about of 2,836.73 Mt CO2 equivalent and the period 2000-2009 changed the biggest contributor to The Russian Federation in the North Asia sub-region with an estimated equivalent of 1,290.27 Mt CO2. All of which highlight the need for improved usage of space information products and services, in addition to applying the integrated model of atmosphere-land-ocean using Regional Environmental Simulator (RES) and fire observation equipment for underground fire detection, setting up local policy and institutions, enhancing capacity building, and setting up financing mechanism for sharing. The last part of the framework aims to build regional and international cooperation with local or national governments or authority agencies.

Keywords: integrated fire management, global warming, forest fire, grassland fire.