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Spatio-temporal variation of food production in Xinjiang Uygur Autonomous Region, China and its causal analyses

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Xinjiang, China has a great agricultural production, and population to be fed is large. Agriculture is the main industry in Xinjiang economy. Interannual changes in food production are delineated from printed materials, such as statistic year book of the province. The data are visualized by using geographic information systems (GIS), and spatio-temporal changes in food production are analyzed.

Food production in Xinjiang shows consistent increase from 1949 to 2008. Based mainly on the policy of the Chinese government, temporal changes are divided into following four intervals, (1) 1949 – 1967, (2) 1968 – 1974, (3) 1975 – 1995, and (4) 1996 – present.

Stage 1 is the steady development era, and further divided into (i) rural economy recovery period (1949 – 1955), and (ii) large agricultural development by people's commune and major advance campaign. Annual increase rate is about 6.3%, and food production increased from 848,000 ton in 1949 to 2711000 ton in 1967.

Stage 2 is stagnation era during 1968 and 1974. The Cultural Revolution between 1968 and 1974 had an effect to food production, and it fluctuate around 3 million ton.

Stage 3 is a slightly fast development era. Economic reform in rural area started from late 1978, and liberalization of agronomic market set up in 1985 stimulate the motivation of farmers to increase production. Total amount of food production increased from 3.11 million ton in 1975 to 7.3 million ton in 1995. Food production doubled during this period.

Stage 4 is the fast development era. The great development policy to western part of China issued in 1998 gave the chance to alter agronomic structure in Xinjiang area. Total amount of food production reached 9.1 million ton in 2008, that is the largest.

The statistic data are compiled by using geographic information systems (GIS) to enable spatial analyses of food production in Xinjiang. Major producing center was southern Xinjiang in 1990's, however, the center moved to north Xinjiang until 2008. The production area expand all Xinjiang area recently.

Principle analyses reveals that four factors, they are (i) planting area, (ii) irrigation facility, (iii) increase in unit area production and fertilizer, (iv) agricultural machine, can characterize the four periods.

In addition to results of statistic analyses, agriculture monitoring in Xinjiang by satellite remote sensing will be presented in the assembly.

Keywords: China, Xinjiang Uygur Autonomous Region, food production, spatio-temporal changes, GIS, remote sensing