TABLE 4: MAJOR LAND AND WATER SYSTEMS AT RISK (A BROAD TYPOLOGY)

Global production systems	Cases or locations where systems are at risk	Risks
RAINFED CROPPING Highlands	Densely populated highlands in poor areas: Himalayas, Andes, Central American highlands, Rift Valley, Ethiopian plateau, Southern Africa.	Erosion, land degradation, reduced productivity of soil and water, increased intensity of flood events, accelerated out-migration, high prevalence of poverty and food insecurity.
RAINFED CROPPING Semi-arid tropics	Smallholder farming in Western, Eastern and Southern Africa savannah region and in Southern India; agro-pastoral systems in the Sahel, Horn of Africa and Western India.	Desertification, reduction of production potential, increased crop failures due to climate variability and temperatures, increased conflicts, high prevalence of poverty and food insecurity, out-migration.
RAINFED CROPPING Subtropical	Densely populated and intensively cultivated areas, concentrated mainly around the Mediterranean basin.	Desertification, reduction of production potential, increased crop failures, high prevalence of poverty and food insecurity, further land fragmentation, accelerated out-migration. Climate change is expected to affect these areas through reduced rainfall and river runoff, and increased occurrence of droughts and floods.
RAINFED CROPPING Temperate	Highly intensive agriculture in Western Europe.	Pollution of soils and aquifers leading to de-pollution costs, loss of biodiversity, degradation of freshwater ecosystems.
	Intensive farming in United States, Eastern China, Turkey, New Zealand, parts of India, Southern Africa, Brazil.	Pollution of soils and aquifers, loss of biodiversity, degradation of freshwater ecosystems, increased crop failure due to increased climate variability in places.
IRRIGATED Rice-based systems	Southeast and Eastern Asia.	Land abandonment, loss of buffer role of paddy land, increasing cost of land conservation, health hazards due to pollution, loss of cultural values of land.
	Sub-Saharan Africa, Madagascar, Western Africa, Eastern Africa.	Need for frequent rehabilitations, poor return on investment, stagnating productivity, large-scale land acquisition, land degradation.

Global production systems	Cases or locations where systems are at risk	Risks
IRRIGATED Other crops	RIVER BASINS Large contiguous irrigation systems from rivers in dry areas, including Colorado river, Murray-Darling, Krishna, Indo-Gangetic plains, Northern China, Central Asia, Northern Africa and Middle East.	Increased water scarcity, loss of biodiversity and environmental services, desertification, expected reduction in water availability and shift in seasonal flows due to climate change in several places.
	AQUIFERS Groundwater-dependent irrigation systems in interior arid plains: India, China, central USA, Australia, North Africa, Middle East and others.	Loss of buffer role of aquifers, loss of agriculture land, desertification, reduced recharge due to climate change in places.
RANGELANDS	Pastoral and grazing lands, including on fragile soils in Western Africa (Sahel), North Africa, parts of Asia.	Desertification, out-migration, land abandonment, food insecurity, extreme poverty, intensification of conflicts.
FORESTS	Tropical forest-cropland interface in Southeast Asia, the Amazon basin, Central Africa, and Himalayan forests.	Cropland encroachment, slash-and-burn, leading to loss of ecosystems services of forests, land degradation.
Other locally important subsystems	DELTAS AND COASTAL AREAS: Nile delta, Red River delta, Ganges/ Brahmaputra, Mekong, etc. and coastal alluvial plains: Arabian Peninsula, Eastern China, Bight of Benin, Gulf of Mexico.	Loss of agricultural land and groundwater, health-related problems, sea-level rise, higher frequency of cyclones (Eastern and Southeast Asia), increased incidence of floods and low flows.
	SMALL ISLANDS Including Caribbean, Pacific islands.	Total loss of freshwater aquifers, increased cost of freshwater production, increased climate-change related damages (hurricanes, sea-level rise, floods.
	PERI-URBAN agriculture	Pollution, health-related problems for consumers and producers, competition for land.

Source: this study