Global Perspectives on Agricultural Injury Prevention: Case Study China

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After 3 days, you need water or you'll perish. You can make it 3 weeks without food.

- In the US every farmer provides food and fiber for 130 people. The loss of a single farmer therefore has implications for all of us.

Worldwide, 60% of all workers are involved in agricultural production.

In the US fewer than 2% of all workers are involved in production agriculture.
Who is a farmer-US definition

- USDA definition of a farm: any place from which $1000 or more in agricultural products were produced and sold, or normally would have been sold, during the year.
- Approximately 2 million “family farms” defined as those with majority ownership of the farm business being held by related individuals. Nearly 98% of US farms are family owned.
- Many farmers hold off-farm jobs so only 40% of all family owned farms are headed by a principal operator whose primary occupation is farming.
- Farm-occupation farmers are more likely to be over age 65 years, live in the Midwest and have lower median income than other US farmers.
- Over the past 10 years, US farm households earned on average 80-95% of their household income from nonfarm sources.
International definitions

The International Labour Organization

• Agriculture:
  – all forms of activities connected with growing, harvesting and primary processing of all types of crops, with the breeding, raising and caring for animals, and with tending gardens and nurseries.

• Agricultural worker:
  – any person engaged either permanently or temporarily, irrespective of his legal status, in activities related to agriculture as defined above.

• Agricultural undertaking:
  – undertakings and parts of undertakings engaged in cultivation, animal husbandry including livestock production and care, forestry, horticulture, the primary processing of agricultural products by the operator of the holding or any other form of agricultural activity.
Work-related injury death rates per 100,000 workers, United States, 1992-2009

Death rates per 100,000

Agriculture

All workers
China

• During the past 30 years China's economy has changed from a centrally planned system that was largely closed to international trade to a more market-oriented that has a rapidly growing private sector.

• China's economy is the second largest in the world after the United States.

• A major component supporting China's rapid economic growth has been growth of exports.
Agriculture in China

• Since 1949, China has lost one fifth of its arable land.
• Soil in China is rapidly deteriorating in quality, eroding or turning to desert.
• Use of fertilizers has increased productivity, partially mitigating declining productivity.
• China feeds somewhat less than one-quarter (21%) of the world's population on approximately 7% of the world's arable land.
Agriculture in China

• There are 425 million agricultural workers in China down from 700 million a decade ago.

• Currently every farmer in China is providing food for 3 people if all those listed as farmers work in agricultural production.*

• Approximately 31% of the population is involved in agriculture.

• Agricultural plots of land were historically small but the Chinese government introduced land reform measures to consolidate the small farms into larger cooperative farms.
Agriculture in China

- Rural residents make 1/3 the income of urban residents.
- This situation has resulted in a migration of young, healthy rural residents to urban areas seeking work.
- The left behind population is made up largely of the oldest and the youngest rural residents.
- These groups are high risk workers in terms of agricultural injury.
Agriculture in China

• Changes in farming practices away from hand labor to more industrial approaches has allowed for productivity to remain high.

Agriculture Law of the People’s Republic of China (2009)

Article 7 The State shall vitalize agriculture by relying on the progress of science and technology and on the development of education.

Article 22 The State shall guide agricultural production and operation organizations or agricultural labourers to adjust the structure of agricultural production according to market demands, ensure steady growth of cotton and grain production, achieve all-round development of crop-plantation, forestry, animal husbandry and fishery, and develop an agriculture with high yield, good quality and high benefits.

Article 33 The State shall take measures of macro-regulation and control to maintain a reasonable price ratio between agricultural products and the principal means of agricultural production such as chemical fertilizers, pesticides, agricultural plastic films, agricultural machinery and diesel oil for agricultural use.
Agricultural tractors* in China per 100 square kilometers of arable** land, 1968-2008

*# wheel and crawler tractors (excluding garden tractors) in use in agriculture

**Arable land includes land defined by the FAO as land under temporary crops (double-cropped areas are counted once), temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow. Land abandoned as a result of shifting cultivation is excluded.

Cereal yield* (kg per hectare) in China

*Cereal yield, measured as kilograms per hectare of harvested land, includes wheat, rice, maize, barley, oats, rye, millet, sorghum, buckwheat, and mixed grains. Production data on cereals relate to crops harvested for dry grain only. Cereal crops harvested for hay or harvested green for food, feed, or silage and those used for grazing are excluded.

Livestock production index* in China

*Livestock production index includes meat and milk from all sources, dairy products such as cheese, and eggs, honey, raw silk, wool, and hides and skins.

Leading causes of fatal agricultural injuries, China and US

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<th>United States</th>
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The northern China livestock market at Zhang Bei town (photo credit: ILRI/Stevie Mann).
Agricultural injuries

China

• In a survey conducted among 1500 farmers in Hubei, China between 1995-1997, the percentage of workers injured was 35.5% among men and 32.8% among women.

• In a survey conducted among 1551 middle school children working on farms in Hunan, China in 2006, the percentage of youth injured was 15.5% among young men and 15.1% among young women.

United States

• In 1978, a survey conducted among 1,972 farmers (including males and females) in Kentucky reported an injury rate of 9.1%.

• In a survey conducted in Colorado between 1993 among 470 male farmers, the percentage injures was 11.7% and among 402 female farmers was 6.7%

• In a survey conducted in Colorado between 2003-2004 among 262 adolescents (13-18 years of age), the percentage of farm injuries among females was 10.9% and among males was 11.2%
Leading agents of nonfatal agricultural injuries, China and US

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<td>Knife/sickle</td>
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<td>Agricultural equipment (including tractors)</td>
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<tr>
<td>Falls</td>
<td>Falls</td>
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<td>Pesticides</td>
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Agricultural injury patterns

• Injury rates reported in China are higher compared to in the United States.

• The leading causes of agricultural injuries in China are shifting from hand tools and animals to agricultural equipment, as expected based on shifting work practices.

• Population growth and international export of food will require increased productivity in agriculture leading to increased risk and severity of injuries and increasingly severity of farm injuries.
Implications for injury prevention

- Increased awareness among occupational health and safety and public health professionals is needed to address agricultural injuries.
- Over a five year period (2007-2011) we trained more than 90 Chinese researchers and public health professionals.
- These scholars have contributed significantly to an increased understanding of agriculture as a hazardous occupation in China, publishing more than 19 articles in English and Chinese and conducting 12 research projects addressing injuries among agricultural workers in China.
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