

China's Experience in Post-disaster Agricultural Recovery—To Minimize Losses to Small Farmers

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1.The meaning of disaster relief

Agricultural disaster reduction includes pre-disaster prevention, disaster resistance and post-disaster relief and recovery. China's policy emphasizes prevention and the combination of prevention and rescue. Although prevention is the first, some disasters are difficult to accurately forecast or still cause great losses. Due to the long agricultural production cycle, especially the early losses may affect the next crop and even the next year or other areas. If the disaster relief and recovery measures are appropriate, the plant or industrial system itself compensation mechanism can be used.



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2. Disaster relief management

- **2.1 Ancient management**
- Grain storage: since Han Dynasty, including official and private warehouse, opened or sold at a low price and transported from the non-disaster areas.
- Relief: official or folk charity relief, including porridge factory to protect health of hungry people, food, money and work chance.
- Tax reduction/exemption based on disaster degree.
- Immigration: distribution of farm tools, migration and resettlement costs.



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- Zhu Jian(1364-1425) wrote "Herbal for Relief of Famines", the world's earliest rescue of famine edible plants monograph, spread in Japan and Europe with highly evaluation.
- Due to undevelopment and corruption, the The ancient policy effects is still poor. The death more than one million famine occurred several times.



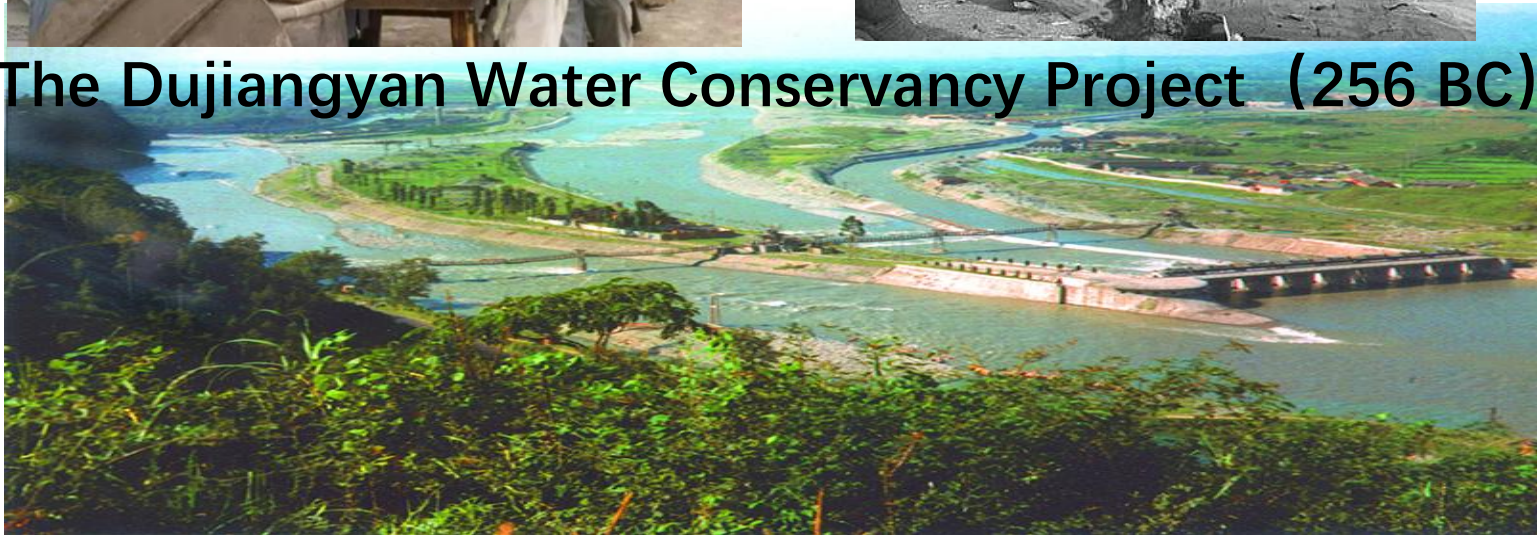
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The Dujiangyan Water Conservancy Project (256 BC)



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• 2.2 Modern disaster relief system

- Since 1950s, the Central Disaster Relief Committee was established. Self-rescue in production, mobilizing military and whole society to provide relief, settle victims, medical/epidemic prevention, tax relief, collective mutual assistance, and supporting disaster areas from other areas were advocated.
- After 1978, towards the scientific, professional, standardized direction, the National Commission for Disaster Reduction and the Ministry of Emergency Management have been established to promote construction of emergency management plans, systems, mechanisms and legal system.



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Rescue victims, temporary tents, distribution of rescue supplies, and volunteers



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3. Post-disaster relief & recovery measures

- **Rural disasters** refer to disasters causing heavy losses to life, property, infrastructure & agricultural production including floods, earthquakes, strong typhoons, storms and wildfires. **Agricultural disasters** refer to injuries and caused to crops, livestock, fish & facilities, including drought, waterlogging, freezing, heat damage, snow disasters, diseases/pests. There is no strict boundary between the two types of disasters.
- **3.1 Living assistance and temporary resettlement**
- Move to temporary security with clean food/water & basic necessities; Organizing migration in different places, settling their livelihood and adapting.



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• 3.2 Restoration of farmland/infrastructure

- Clearing and leveling the farmland, roads, commu-nications, water/supply, commercial and service, health and education restored, and micro-credit.



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• 3.3 Judgment of disaster situation

- Accurate judgment/evaluation is the premise of efficient disaster relief.
- Methods: remote sensing, communication, mobile, site investigation and victims investigation.
- Some easier, some need professional knowledge.
- ① false reviving of wheat seedlings in early spring after freezing, some withered but not real dead. Judging based on tillage node and growth cone.
- ② Drought, freezing, insect and diseases can cause leaf wilting, freezing from the top, drought from the base, the latter from the infestation.



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- ③lodging evaluates according to developmental stage, degree and ratio. Maize can be tied only within 2 days. Before jointing, stem can self restore upright, afterthen can bend grow, after flowering it cannot restore upright.
- ④Rice seedlings can tolerate short-term flooding and fail after heading.



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3.4 Remediation and management

- based on the degree and recovery potential.
- ①**Lack of seedlings**: sowing soaked seeds of early varieties, removing from the dense with soil.
- ②**Use of compensation ability**: watering/fertilizing to increase tillers, or grain number and weight, or branches of cotton, rape and fruit trees to compensate seedlings or stems loss.



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- ③ Bees/artificially pollinating for fruit trees after frost or spraying stimulin to expand ovary.
- ④ Do not cut off and Keep the hail torn leaves
- ⑤ Strategies anti-drought: Ensuring drink firstly, limited water-saving irrigation gives priority to high-yield and the near cropland. Using water injection seeder, 2-3 liters per hole(100 m³/ha) are injected to ensure emergence. Mid term varieties were sown waiting for early rain and short term varieties for late rain in dryland.
- Moving animals to no drought pastoral areas and paying compensation, tranfering adult animals to agricultural areas for quickly fattening, remaining young & mother animals to wait the next season.



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- **3.5 Remedies for no harvest crops**
- ① Sowing the next cropping depends on remain thermal time. Spring wheat, barley or rape can be sown just after frozen winter wheat seedlings dead in order to keep double cropping, If delay the time you can only sow for one cropping.
- In Beijing area, when the next crop after wheat fails,



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- very short term millet variety can be sown in early July, radish/beans in mid July, buckwheat in late July, Chinese cabbage in early August or its seedlings transplanted in mid August, otherwise only winter wheat can be sown until early October.
- ②Market analysis: In early August, Chinese cabbage was sown after gibig flood in mid July 2012, prices slumped due to overmarket capacity. If contracts were signed with South, loss/rot could be avoided。
- ③Ratoon rice is a popular remedy technique in the South with 1700 years history if there are 2 months of growth still. Keeping stubble of 1/3 height, irrigating for 5cm depth and weeding 2-3 days later, Axillary bud will soon breed and heading, the yield can reach 80% of the normal rice.



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• 3.6 Alternative livelihood

- After disaster, short-term vegetables should be planted according to market needs, other industries such as fruit trees, animal husbandry, fishery, handicraft/rural tourism should be developed. Local governments organize work chances in cities or infrastructure construction and give priority arrangements.



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• 3.7 Agricultural disaster insurance

- Since 2007, China began to pilot agricultural insurance subsidies, the market size became the world second now and covering >70% of the major grain crops, but lower for other crops and industries. In order to reduce the prospecting cost and moral hazard, the pilot project of agricultural weather index insurance has made some progress.

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