

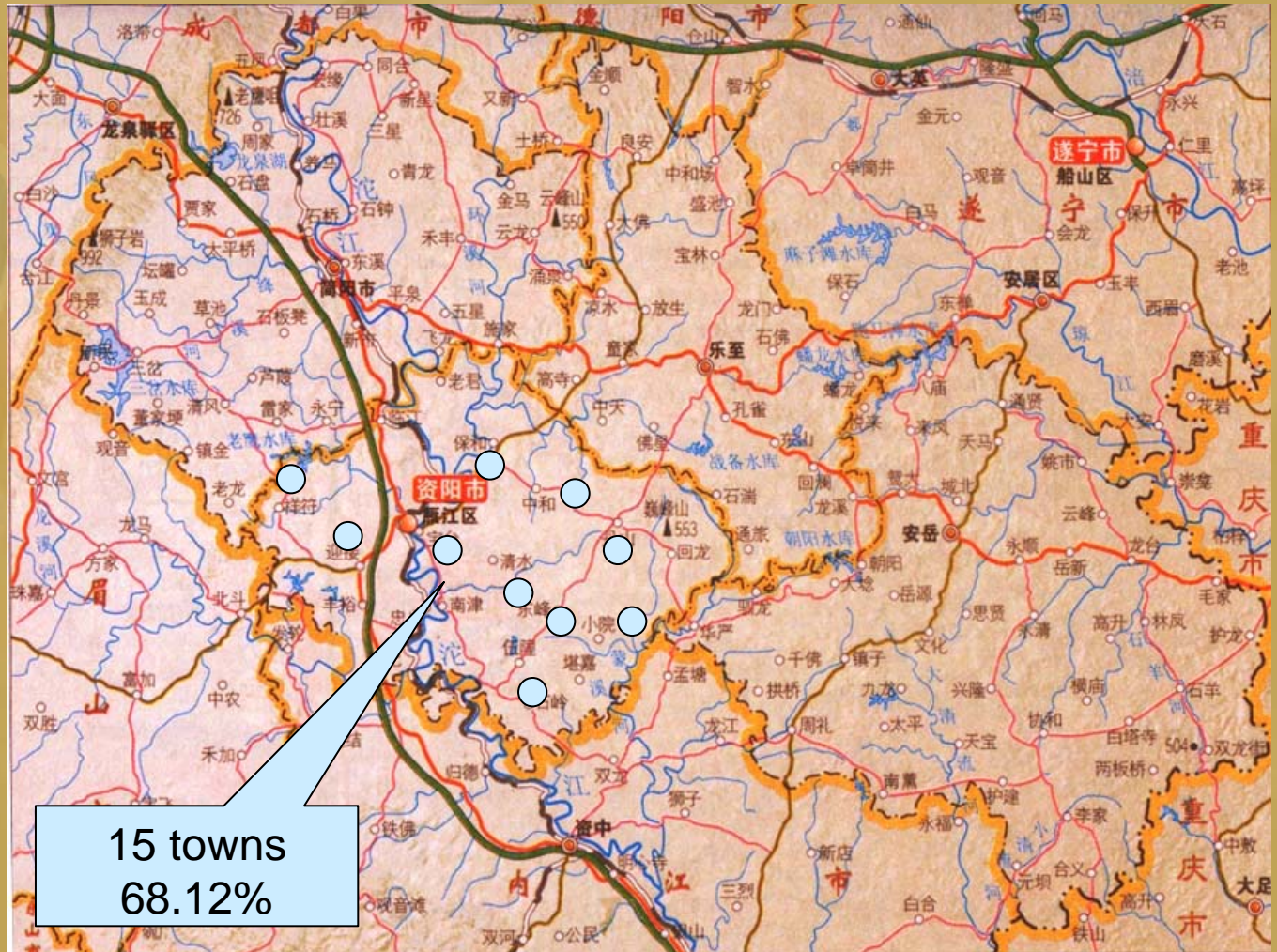
The background of the slide features a collage of traditional Chinese opera masks and a woman's face. The masks are rendered in a stylized, semi-transparent manner, showing various expressions and colors like yellow, orange, and grey. A woman's face with a floral headpiece is visible in the lower-left corner. The overall color palette is warm, dominated by yellow and orange tones.

# **Outbreak of Streptococcus Suis Epidemic Disease and Construction of Biogas**

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## Outburst Condition of Streptococcus Suis Epidemic Disease

- ◆ The streptococcus suis epidemic disease, which was really an unexpected public health incident, happened in Ziyang, Sichuan and other places in our country from June to August in 2005.



- ◆ **There are 204 cases of human streptococcus suis infections, including 38 death cases and 20 in-patient cases, and 146 cases were cured;**
- ◆ **The cases dispersed over Ziyang, Neijiang, Chengdu and other places altogether 12 cities, 37 counties (cities, districts), 131 towns (streets) and 195 villages (neighborhood committees);**



- ◆ **The total number of infected dead pigs is 647;**
- ◆ **The total attack towns accounted for 18.64% of the total towns-21 counties (cities);**
- ◆ **The average number of dead pigs is 7 in each attacked town;**
- ◆ **The average number of dead pigs is 4 in each attacked village.**



- ◆ **The Specialist Investigation Team from Department of Agriculture indicated in the survey report of comparing the external conditions of farmer pig-keeping between Ziyang epidemic area and its neighboring non-epidemic-stricken area (Anyue County):**
- ◆ **The poor breeding conditions, high temperature and high wet in pen during farmer household pig raising are leading causes for the onset and aberrance of this streptococcus suis.**

**The relationship between the external condition of streptococcus suis  
outbreak and construction of biogas tanks**

- ◆ **1、 Surface survey: construction situation of biogas tanks in the whole area, general situation of the epidemic disease outbreak as well as basic information of the farmer household's pig raising;**
- ◆ **2、 Model survey: To investigate ty**  
**village and farmer household;**



# Survey Contents

- ◆ **Farmer households' basic information (population, economic position, planting situation.**
- ◆ **The construction situation of biogas (construction duration, cubage of biogas tank and the comprehensive utilization information of biogas.**
- ◆ **The outbreak situation of epidemic disease (whether the epidemic disease occurred or not and the infected and death situation of the pigs)**
- ◆ **The basic breeding situation( pig-keeping quantity, death situation, sanitation and ventilation condition of the pen before and after the outbreak of the epidemic disease).**

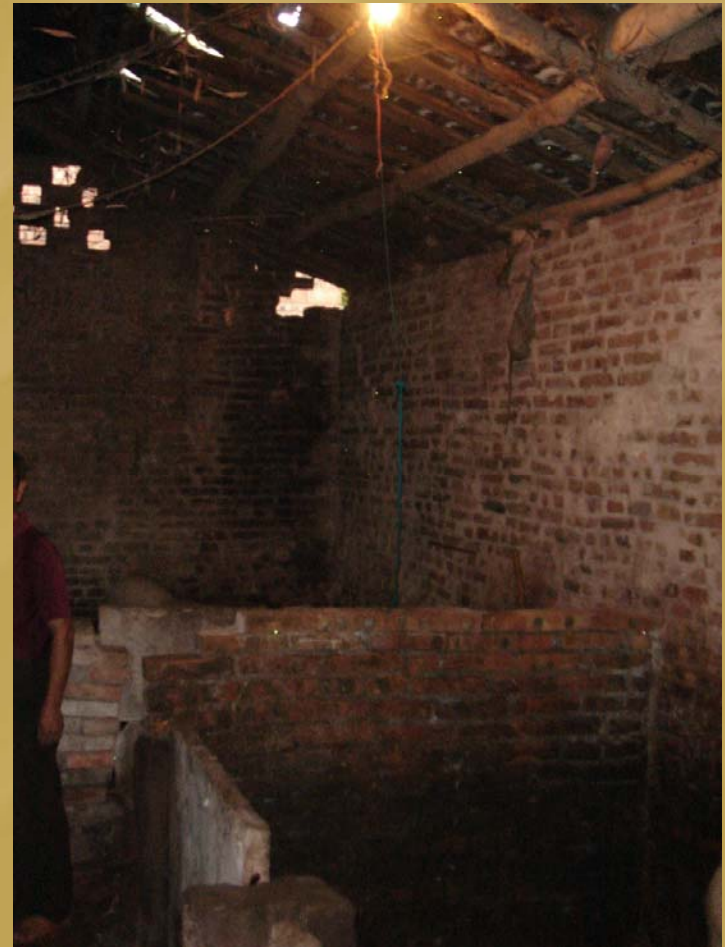
# 1、 Survey on the typical Village

- ◆ **With the assistance of rural energy office of Yanjiang in Ziyang, we carried out a major investigation to the 295 pig growers in Renle Village in Beiji Town. In this village, the amount of live pigs on hand is 713, and the sold number is 1087. There are 128 growers having constructed biogas and 167 growers not yet. The streptococcus suis infection did not occur in this village.**



# Survey on the Typical Farmer Household

- ◆ The grower Shen Guohua hasn't constructed bilgas tank- Liushe, Shiti Village, Songtao Town is one of the places occurred the epidemic disease first. He raised 6 pigs, and the pigs begin to die on July 11. Within two to three days, the total number of dead pigs reached three. The ventilation condition of the pen was improper and the ambient condition was bad. In days gone by, the time of death is July to August according to the record of diseased pigs and dead pigs.



- ◆ **The grower Zhang Bifang hasn't constructed biogas tank- Ershe, Shiti Village, Songtao Town is one of the places occurred the epidemic disease first. He raised 20 pigs, and the pigs begin to die on July 29. Within two to three days, the total number of dead pigs reached three. The ventilation condition of the pen was improper and the ambient condition was bad. In days gone by, the time of death is July to August according to the record of diseased pigs and dead pigs.**



- ◆ **The grower Li Senlin has constructed biogas tank-in Yishe, Shunhe Village, Songtao Town (with six people). The land area here is one mou and main plants are corn, wheat and potato. The annual revenue is 4000 Yuan /person. The total number of the pigs is 39 and the biogas tank is 30m<sup>3</sup>. "Three reform methods for one tank" is being carried out here. The pen is well-ventilated and the ambient condition is proper. Since the biogas tank had been constructed, hog cholera and pigs dying phenomena have never occurred.**



- ◆ **The grower Dong Ziquan has constructed biogas tank-in Yishe, Shunhe Village, Songtao Town. The total number of the pigs is 30 and the biogas tank is 12m<sup>3</sup>. It is a national debt project of Department of Agriculture. "Three reform methods for one tank" is being carried out here. The pen is well-ventilated and the ambient condition is proper. Since the biogas tank had been constructed, hog cholera and pigs dying phenomena have never occurred.**



# Survey Result and Conclusion

## 1. Feature of Streptococcus Suis Epidemic Disease

- ◆ 1.1 The epidemic disease distributed in a punctual way: The number of dead pigs suspected to be affecting streptococcus suis epidemic disease II is 165, dispersed.
- ◆ 1.2 Analyzing from epidemiology angle, there is no direct pertinency among epidemic spots. Most animal epidemic areas are relatively independent. There is a long distance from one epidemic spot to the other, and there is no direct epidemiological pertinency between each other.

- ◆ **1.3 Features of time distribution:** The survey shows that it is hot, damp and rainy in the epidemic area from June to August. The outbreak of streptococcus suis epidemic disease has a certain seasonal nature. (The temperature in Ziyang is 2 °C higher than that of the same period last year, and the moisture capacity lifts up about two to five percentage point. The occurrence time of the epidemic disease is the same as that of former Neijiang in Sichuan in 1976; The occurrence time and the climatic feature are similar to those of Nantong in Jiangsu in 1998.)
- ◆ **1.4 Feature of Group distribution:** It all occurred in countryside and remote areas of bad economic condition. The sanitary condition is bad, the pen ventilation is improper and it is sunless and damp in animal breeding sites where epidemic disease outburst.

## 2. The Prevalence Rate of Biogas is Low

- ◆ There are 266656 farmer households in the whole area, including 25107 having biogas tanks. The prevalence rate is 9.4%. There are only 3400 farmer households having carried out "three reform methods for one tank", which accounted for 1.3% of the total number of farmer households and 0.074% of the farmers having biogas tank.

## 3. Rural Environmental Pollution and Poor Sanitation

Among the 167 farmer households who have not constructed biogas tank, nearly all farmers discharges the domestic fowl and livestock dejecta directly into the natural environment without collection or simple treatment. The waste is stacking all around, and the household sewage is overrunning everywhere, which result in the breeding of mosquitoes and flies, and the air is thick of pungent effluvium. The living environmental condition is terrible here.

## **Pollution Outside Yard**

- ◆ **The long-term over-cultivation and excessive usage of pesticide, fertilizer and mulching film cause a variable degree of pollution to the cultivated land;**
- ◆ **Among the farmers accepting investigation who uses fertilizer as manure, the average expense on only manure and pesticide is as high as 1000 to 1500 Yuan for each farmer household annually. The physical condition of the soil is falling year after year but the number of pest does not decrease, thus the output declines to a greater or less extent;**
- ◆ **Although the expense on manure and pesticide reduces 30 - 50% for the farmer households who have biogas tanks, some farmers do not adopt scientific and proper method of biogas application but use biogas excessively which causes crop lodging, output reduction, the nutrient overload of soil water bodies and the destruction of land capability. It brings about the secondary pollution of soil.**

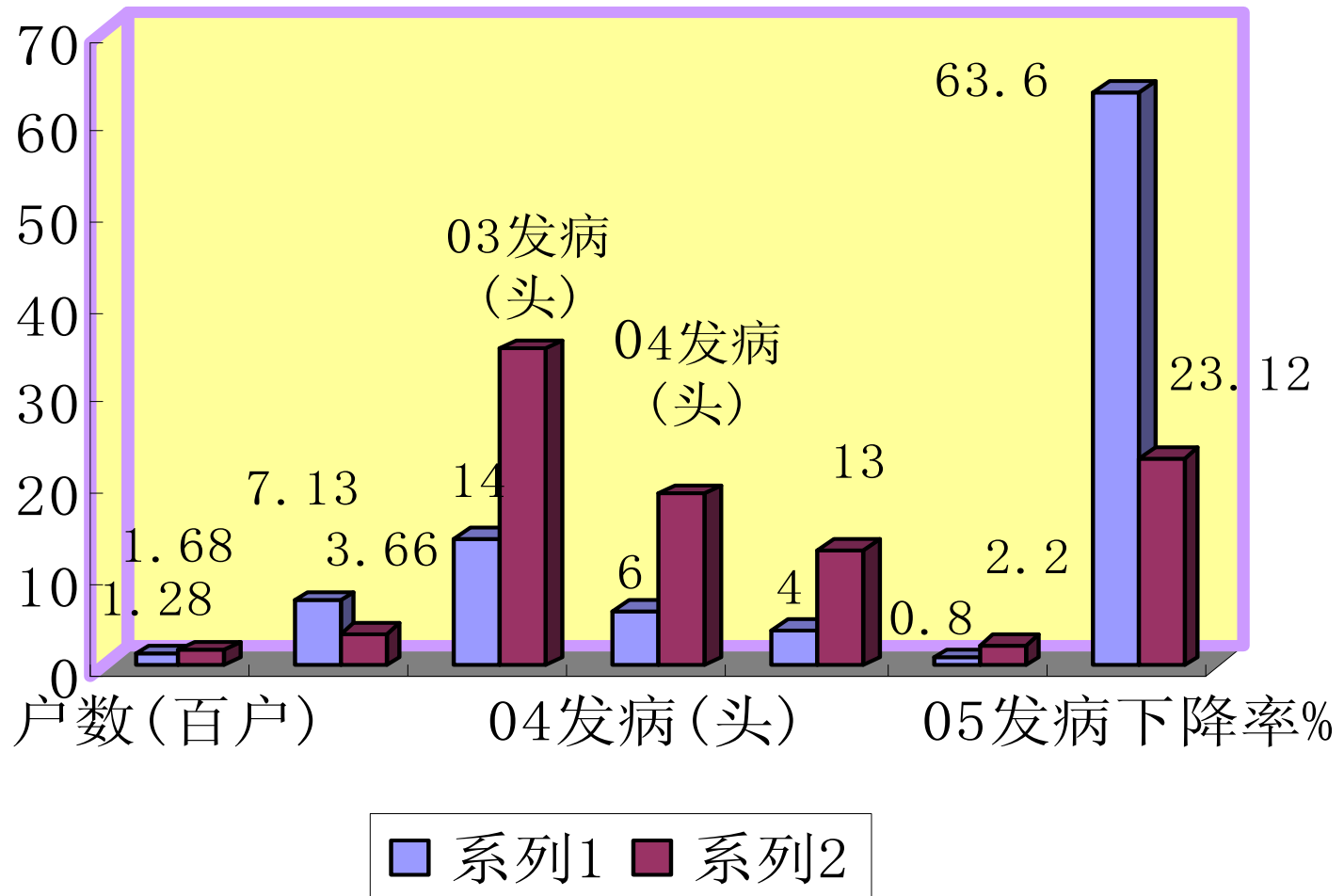


**4. Construction of biogas tank plays an important role to prevent and control the outbreak of domestic fowl and livestock disease.**

- ◆ **No biogas tank was constructed in the scene of the dead pigs suspected to be affected streptococcus suis epidemic disease II.**
- ◆ **There was no case of streptococcus suis epidemic disease or disease suspected to be streptococcus suis and there is no ill and dead pigs because of affecting streptococcus suis in the places where have constructed biogas tanks.**
- ◆ **There were two cases of streptococcus suis infections. 10 pigs died. It occurred in two farmer households. These two farmers did not construct biogas tanks.**

There is no case of epidemic disease occurred in the whole Beiji Town.

Comparing the case history of Renle Village in Beiji Town before and after the construction of biogas tanks



- ◆ **Construction of biogas tank improves the sanitary condition of the farmer households greatly.**
- ◆ **During the inspecting course of the 299 farmers, we paid special attention to the ambient condition of pig-keeping. Although there is no specific quantification index to assess the sanitary condition of the pigpen, we got an impression that the sanitary condition of farmer households who have biogas tank is better than that of farmers who have not, and the pen is clean and well-ventilated.**



- ◆ **According to the above findings, the key induction factor of the outbreak of this epidemic disease is the external environmental condition. It is the bad sanitary condition of the pen and the average air temperature's 2°C higher than that of former years that cause the high temperature and high wet and induce this epidemic disease.**
- ◆ **If we pay attention to the sanitary condition of the pigpen and re-enforce development effort on biogas under such high temperature and high wet, the action of induction factor would be interdicted and the outbreak and contagion of the streptococcus suis epidemic disease would be prevented and controlled effectively.**

**Thank You!**

