

**Thinking about circular agriculture
development
based on prataculture in the hills
area in China**

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Introduction

This presentation includes four parts:

- 1. The big challenges facing Chinese agriculture and the potential of grass productivity in the hills area;**
- 2. Disadvantage growing grain crop in the hills area;**
- 3. Estimation of the potential grass productivity in the hills area in China**
- 4. Policies and suggestions**



1. The big challenges facing Chinese agriculture and the potential of grass productivity in the hills area

“Who will feed China? ” (US.Mr.Lester. Brown said in 1995)

The issue “how to feed China?” is far more important than the issue “Who will feed China? ” for China

The policy regarding grain production as the key , during period of the planning economy from 1949 to 1978



The big challenges facing Chinese agriculture

As China's economic growth moves it up the food ladder, demand for more meat, requiring more feed grain including grass while the arable land is decreasing both relatively and absolutely

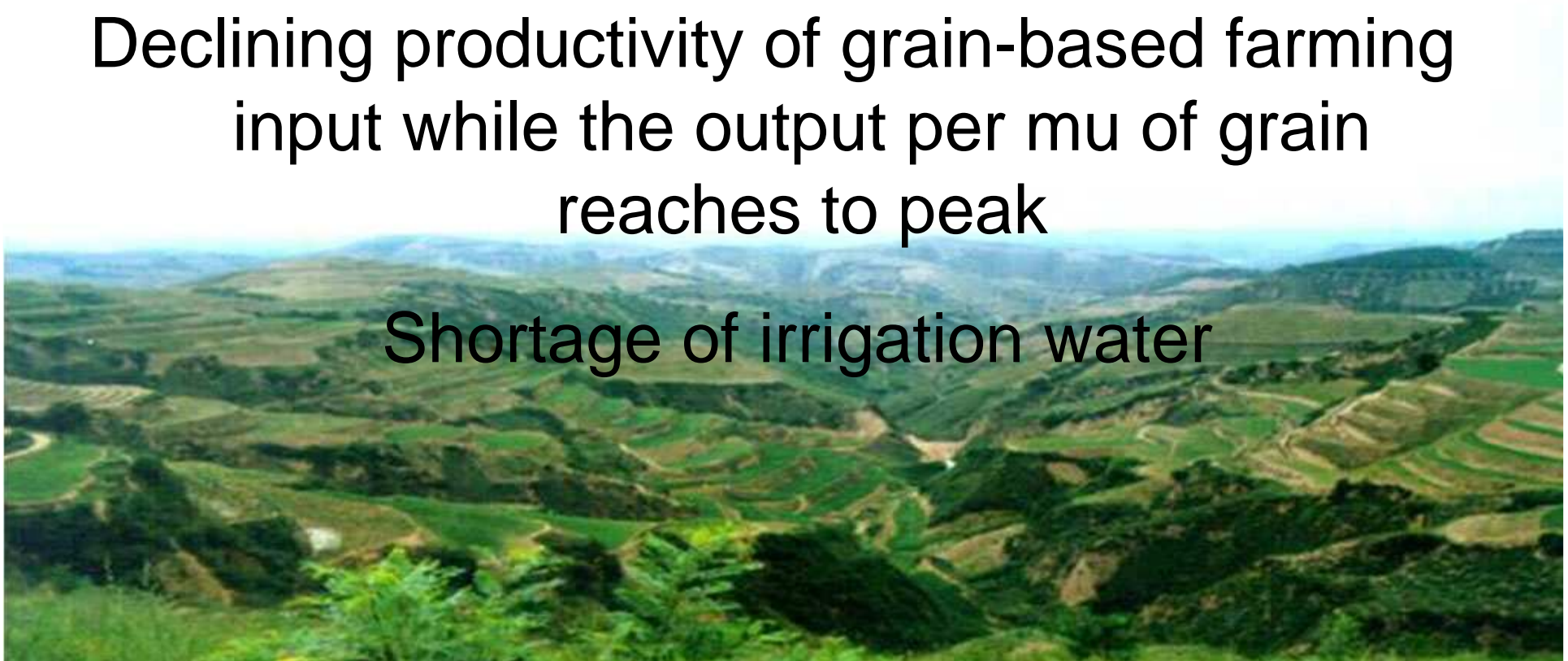


Continue:

Environment and eco-systematic degradation by exploring the hills area for the purpose of grain production

Declining productivity of grain-based farming input while the output per mu of grain reaches to peak

Shortage of irrigation water



Continue:

The returning farmland to forestry land and grassland in the western China development has been effectively put into practice

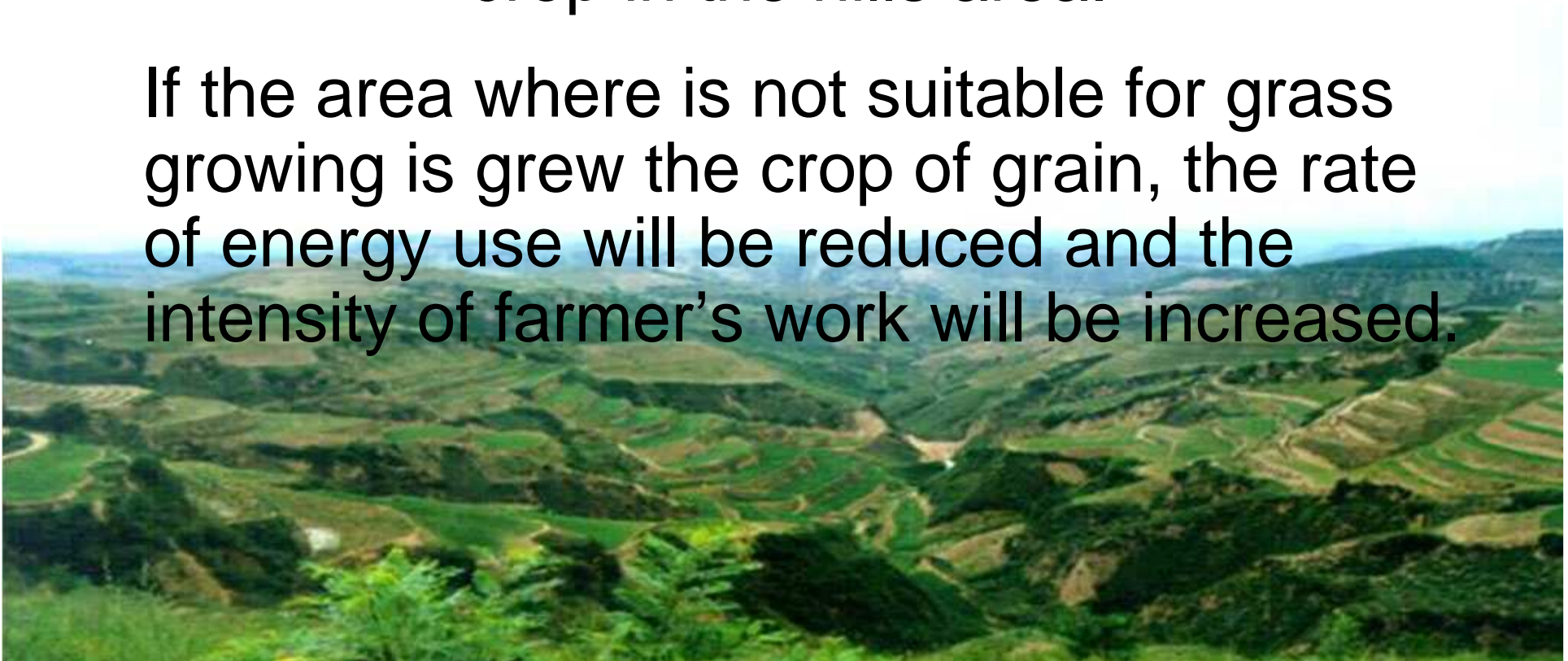
But the returning farmland to forestry land and grassland in the hills area outside the western China has not yet done completely while the detail and effective pratacultural planning is quite lack.



2. Disadvantage growing grain crop in the hills area

The increasing intensity of farmer's work and energy loss results from growing grain crop in the hills area.

If the area where is not suitable for grass growing is grew the crop of grain, the rate of energy use will be reduced and the intensity of farmer's work will be increased.

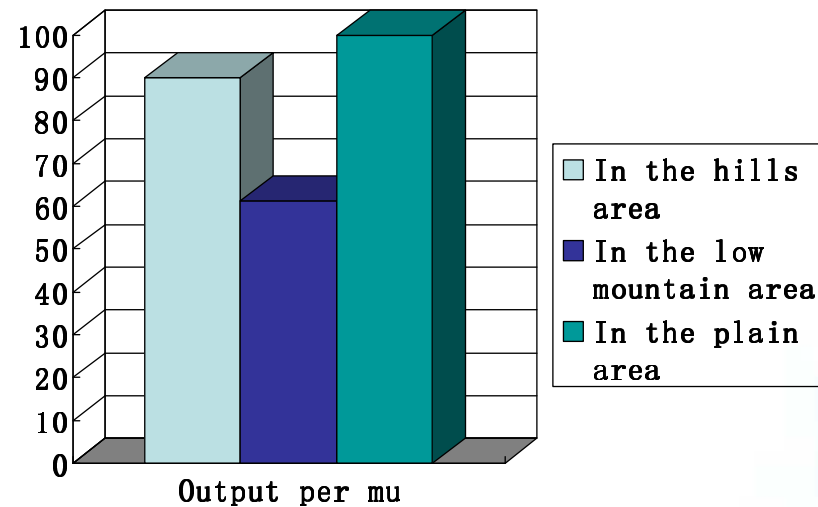


Growing grain crop in the hills area easily produces the loss of water and soil.

The agricultural productivity can be sustainable based on the circling use of water and soil, but after growing grain crop in the hills area, the surface soil is ploughed year by year, which is very easily lost during raining. As a result, eco-system in the hills area is gradually degraded.

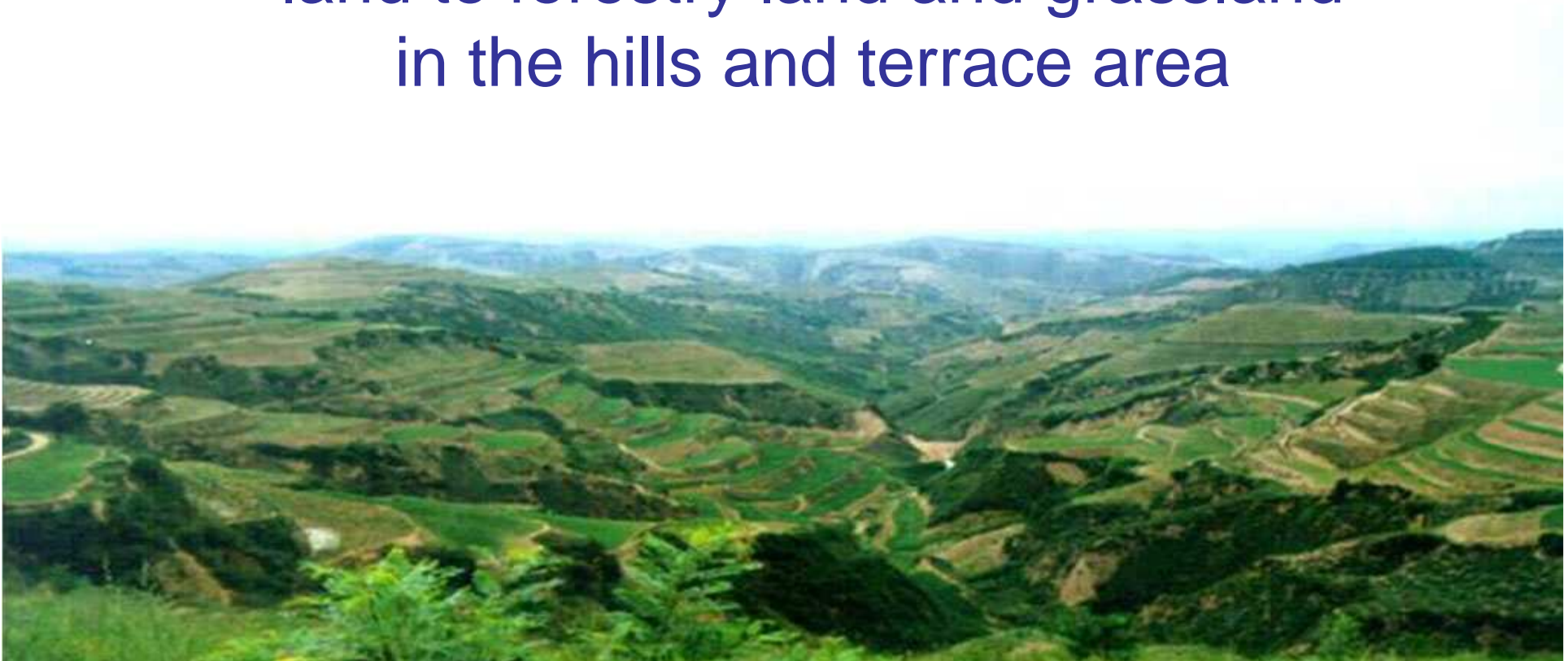


The output per mu of grain crop in the hills and low mountain area is separately 10% and 38.8% lower than plain.



3. Estimation of the potential grass productivity in the hills area in China

3.1 The potential of returning arable land to forestry land and grassland in the hills and terrace area



(Table 1)

Seeing from Table 1, the proportion of the hills area which has not been returned arable to forestry land and grassland is 79.41% in Yellow River valley, this proportion in Yangtze valley is 75.14%.



3.2 Forage grass potential output

(Table 2)

Seeing from Table 2, the average fresh grass output of these nine pasturages is 111697.73 kg/hm², the average hay output is 59654.32kg/ hm², the average material content is 53% equally.



4. Policies and suggestions

(1) Establishing the modern concept of grain including grass and investigating the status quo of Nation-wide pratacultural resource in the hills area in China

(2) Great effort is made to develop the grass breeding



(3) Making the detail and effective pratacultural planning in the hills area, determining the border between the grain production zone in plain and grass production zone in the hills area except prairie

(4) The Adjustment of livestock product structure.



We should advocate the following model based on the circular agriculture law, *grass* is planted on hills-tops and *hills-slopes* while cow and sheep is herded there, fruit trees are planted at foothills. If the model is widely expanded in the hills area, the circular agriculture in this area will be successfully achieved.



Thank you all very much!



Table 1 the potential of returning arable land to forestry land and farmland in the hills area

Huanghe River valley and northern China					
Region	Total area	Existing area	Returned terrace	Returned arable	Not returned (%)
Beijing	5	3.2	1.9	0	64.00
Tianjin	0	0	0	0	0.00
Hebei	155.5	49.3	104.1	2	31.70
Shanxi	639.2	427.8	206	5.4	66.93
Inner Mongolia	100.8	93.4	0	7.3	92.66
Liaoning	82.1	63	19.1	0	76.74
Jilin	147.6	144.9	0	2.7	98.17
Heilongjiang	91.1	87.7	0.1	3.3	96.27
Henan	48.9	17.1	28.8	8.4	34.97
Shaanxi	845.8	713.9	131.9	0	84.41
Gansu	1143.3	956.2	154	33.1	83.64
Qinghai	123	109.5	5.3	8.1	89.02
Ningxia	151.8	140.7	0.7	10.4	92.69
Xinjiang	1.1	0.4	0	0.7	36.36
total	3535	2807.1	652	81.5	79.41

Yangtze valley and southern China					
Region	Total area	Existing area	Returned terrace	Returned arable	Not returned (%)
Anhui	183.7	87.1	96.7	0	47.41
Jiangxi	260.2	41.1	219.1	0	15.80
Hubei	633.1	421	212.1	0	66.50
Hunan	375.4	175.1	200.3	0	46.64
Guangxi	375	298.7	76.3	0	79.65
Hainan	8	7.8	0.2	0	97.50
Chongqing	807.9	592.4	215.5	0	73.33
Sichuan	1645.1	1242.4	368.4	25.1	75.52
Guizhou	1537.7	1255.3	280.9	1.5	81.63
Yunnan	2211.4	1921.7	289.7	0	86.90
Tibet	39.1	19.9	19.2	0	50.90
Henan	94.9	33.4	56	0	35.19
Shaanxi	297.2	250.8	46.3	0	84.39
Gansu	86	55.7	25.1	5.4	64.75
Qinghai	7.8	7	0.3	0.5	89.74
total	8663.4	6509.3	2106.2	42.4	75.14

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Table2 Various fresh grasses or hay output and the proportion

Name	fresh grass output (kg/hm ²)	Hay output (kg)	material content (%)	carrying capacity
Onobrychic viciaefolia	96282.2	24378. 6 5	25. 32	48
Sudangrass	138250.90	126032.2 9	91. 16	252
chicory	89931.31	42807.30	47. 60	84
Euchsaena mexicana Schrad	127563.80	94126.78	73. 79	198
Amaranthus	85383.58	72406.98	84. 80	144
Sweet sorghum	121651.70	86684.14	71. 26	172
hybrid pennisetum	75378.58	49006.63	65. 01	98
Lactuca indical	167868.00	49766.15	29. 65	99
Medicago sativel	107333. 60	25667. 1 6	23. 89	51
Average	111697. 73	59654. 3 2	53. 00	120