

## SAFE-World Project/Initiative Summary

**Country: China**

Project/Initiative Title: HEBEI PLAIN - To Increase Yield, Profit and Resources Use Efficiency in The Wheat-Maize Double Cropping System by Deliberate Design with Farming Systems Approach and The Principle of Stimulating Effect, 1996

Scale: community

Nos. farmers: 224,000 households

Hectares: 100,000 ha

Agro-Ecological Zone: IV

Improvement types

1x	2	3	4	5	6x	7	8	9
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Success and Limits to spread

Success 3a, 3e	Limits 3a
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### A. Key Impacts

#### ***A1 – Productivity***

	Before/Without	After/With	% change
Wheat	6900 kg/ha	8045 kg/ha	17
Maize	7200 kg/ha	7883 kg/ha	9

#### ***A2 – Impacts on natural capital***

Increase in water use efficiency by crops: 40%;

Decrease in irrigation water amount: 30% (1 680 cubic meters per hectare);

Decrease in nitrogen application rate: 20%

#### ***A5 – Key changes in farm / regional system***

Increase in annual crops yield is 10 %.

Increase in annual profit per hectare: 30%

Increase in water use efficiency: 40%

Increase in profit per hectare: 30%

Decrease in irrigation water: 30%

Decrease in nitrogen application: 20%

a. The R&D project was funded by the Science and Technology Committee of Hebei Province.

b. Finance an personnel rce inputs by the local government (Xinji County) for the extension.

### B. Types of Sustainable Agriculture Improvements

Type 1: Better use of available renewable natural capital

- Type 2: Intensification of single sub -component of farm system
- Type 3: Diversify by adding new productive natural capital and regenerative components
- Type 4: Better use of non-renewable inputs and technologies
- Type 5: Social and participatory processes leading to group action for making better use of natural capital
- Type 6: Human capital building through training-learning programmes
- Type 7: Access to Finance
- Type 8: Add value by processing to reduce losses and increase returns
- Type 9: Add value by direct or organised marketing of produce to consumers

	Yes/No	Narrative
Type 1	x	Optimal design of the cropping system and management practices at all levels, which is easily adaptable by the farmers. Among the management practices, water saving irrigation and fertilization practice was developed following the 'stimulating effect'.
Type 2		
Type 3		
Type 4		
Type 5		
Type 6	x	Suitable extension activities through the local government's extension system (TV and radio programs, adult education, etc.)
Type 7		
Type 8		
Type 9		

### **C. Key Lessons: Success, Spread and Constraints**

#### ***C1 – Key Lessons Learned***

Farming systems approach can play an important role in sustainable agricultural development.

System thinking and integration of theories and approaches should be employed for a successful farming system design.

Internal mechanisms should be paid great attention to in analyzing and designing the system.

The extending technique should be advanced and simple, although it may be resulted from a sophisticated research, analysis or design, to make it easy to be accepted by the farmers.

Collaboration between researchers, extension technicians, local governments and the farmers of all levels are key important.

#### ***C2 – Aspects of local/national context contributing to success***

The financial and personnel support provided by the local government for extension. The key important is that the objectives and the results of the project meet the local and national needs.

#### ***C3 – Limitations preventing spread***

The small scale of crop production. The average farmland area managed by per farmer is

0.21 hectare. This region is at the level of the nation's average.

***C4 – Policy issues***

Too small financial input from government for agriculture development both in national and local level.

***C5 – Scaling-up***

More advance technology transfer tools, more funding for the extension from national and local governments, better education in rural areas, and high quality and well paid extensioners.

**D. Contact Point for Project/Initiative**

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**E. Project Narrative**

*China: Wheat-Maize Double Cropping Programme, Hebei Plain*

The Hebei Plain in Northern China is an area of great potential crop productivity which is currently farmed on a small scale with farm sizes averaging at 0.21 ha. Reports that the wheat-maize cropping system could result in productivity of 15 tons per hectare prompted agronomists from Hebei Agricultural University, in collaboration with local government, to set up a project using a Wheat-Maize Double Cropping System on Hebei Plain. This project was started in 1996 and is financially supported by the provincial government, Xinji County government, and the Science and Technology Committee of Hebei Province.

After a successful field plot study, several model fields were set up to demonstrate the technique to the local farmers. A video program and printed materials were made for extension purposes. Now the technique has been demonstrated in and extended over a large area (100,00 ha) and is being practiced by many farmers at the community level (around 224,000 households and 990,000 beneficiaries). Management practices and the cropping systems were designed to be easily adaptable by farmers and included water saving irrigation and fertilization practices developed following the “stimulating effect”.

Before the Wheat-Maize cropping system was adopted, regional average wheat yields were 6.9 t/ha and for maize 7.2 t/ha, however an increase in yields of 10% has resulted, since adopting the system the annual yield is 14.1 t/ha. This represents an increase in annual profit per hectare of 30%. In addition to providing higher productivity the double wheat-maize cropping system is more sustainable and efficient as it reduces the amount of water used for irrigation by 30% and the amount of nitrogen applied by 20%.

Under 2 heavy irrigation for wheat and 3 light irrigation for maize:

In the experimental field: wheat 8.045 t/ha, maize(corn) 7.883 t/ha. Annual yield of the wheat-maize double cropping system 15.928 t/ha.

Regional scale average: wheat 6.9 t/ha, maize 7.2 t/ha. Annual yield of the wheat-maize double cropping system 14.1 t/ha