



# The Sustainable Development of Dryland by application of PPP

UNEP China  
7 July 2015

# Env Challenge of Sustainable Development

- 1. Why: env changes**
- 2. How: The solution of resource and environment**
- 3. What: Action**

# \* Rio+20: Launch UNEP Two Flagship Reports in Chinese



**RIO+20**  
United Nations Conference  
on Sustainable Development



**Green Economy: Pathway  
Towards Sustainable  
Development**



**Global Environment  
Outlook: Science for policy  
makers**

# Trends of env change

- **Atmosphere: CC (GHG), extreme weather, air pollution**
- **Land**
- **Water supply, pollution**
- **Biodiversity**
- **Chemicals and waste**

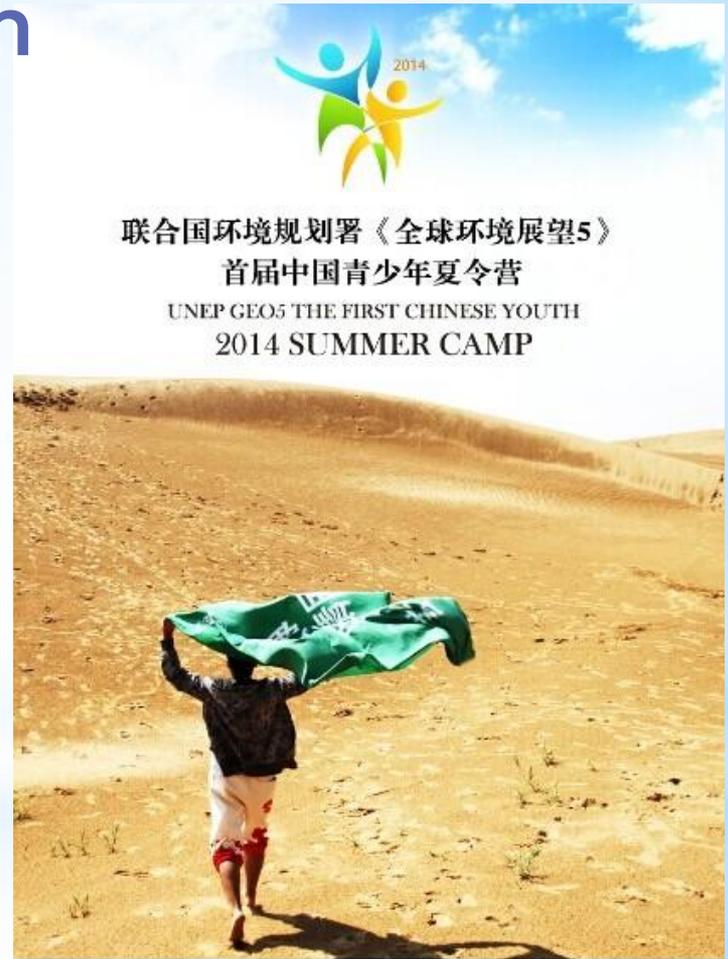
## 2. Env & Economic Solutions: PPP



亿利公益基金会  
ELION FOUNDATION

# The Collaboration with Elion Foundation

# Environmental Awareness Global Environment Outlook 5 Outreach



# Review of the Kubuqi Ecological Restoration Project A Desert Green Economy Pilot Initiative





# Towards a **GREEN** economy



# The Value of Ecosystem Services



**Provisioning Services**



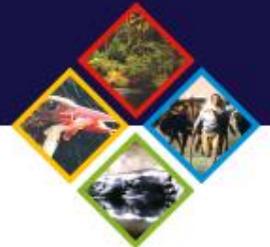
**Regulating Services**



**Cultural Services**



**Supporting Services**



# ■ Geography and Geopolitical history



- **Plantations**

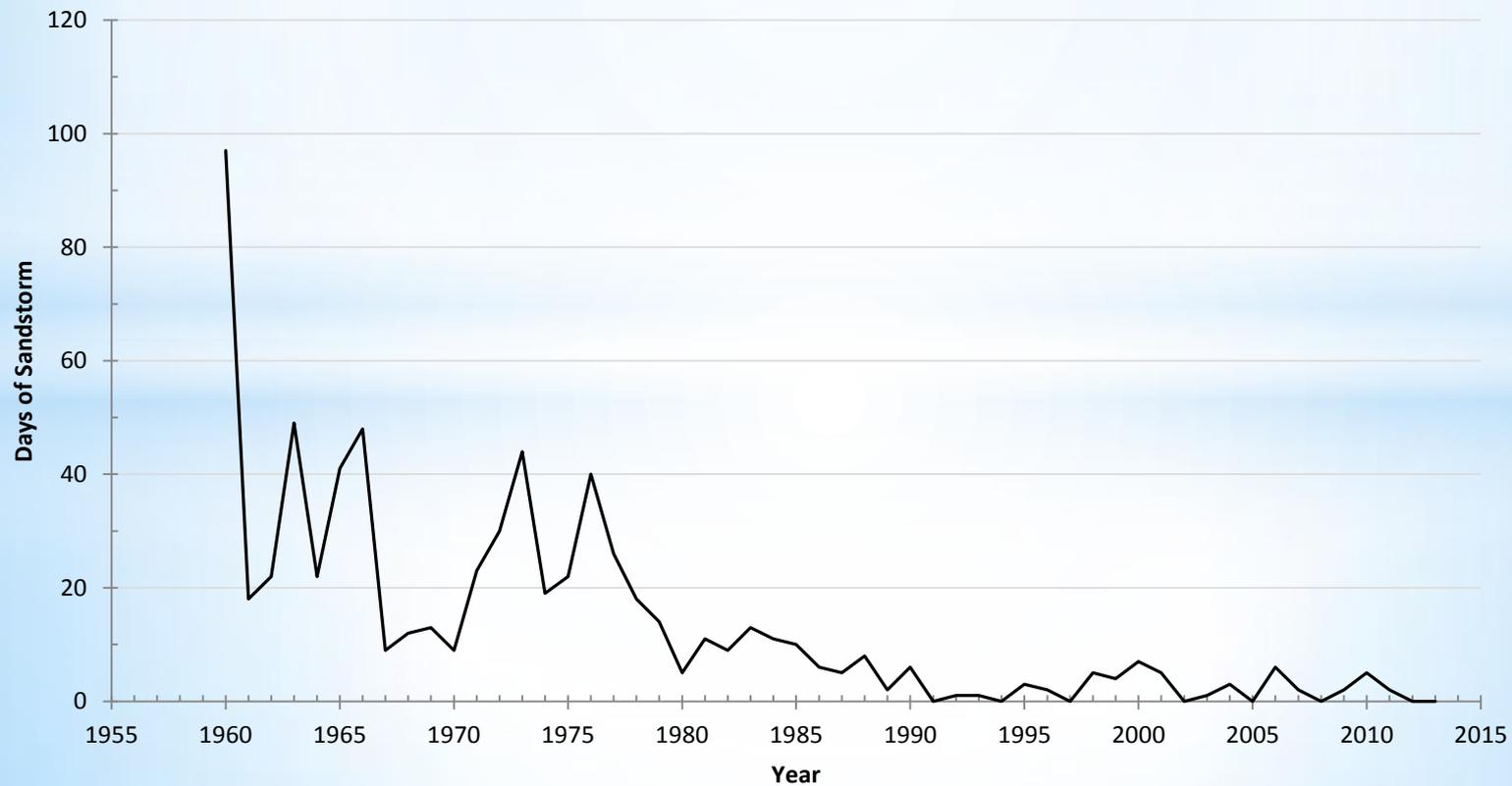


Plantations on the south bank of the Yellow River

# Shelterbelt plantations along the Yellow River and stabilization of hinterland



# Annual sandstorm days at Hanggin Banner weather station (1960-2013).



## ■ Desert ecological restoration

- **Technical innovations**
- **Plantations**
- **Production economics**
- **Development of industries**

- **Technical innovations**



Water jetting



Air jetting



Bundled flat sand barrier technology



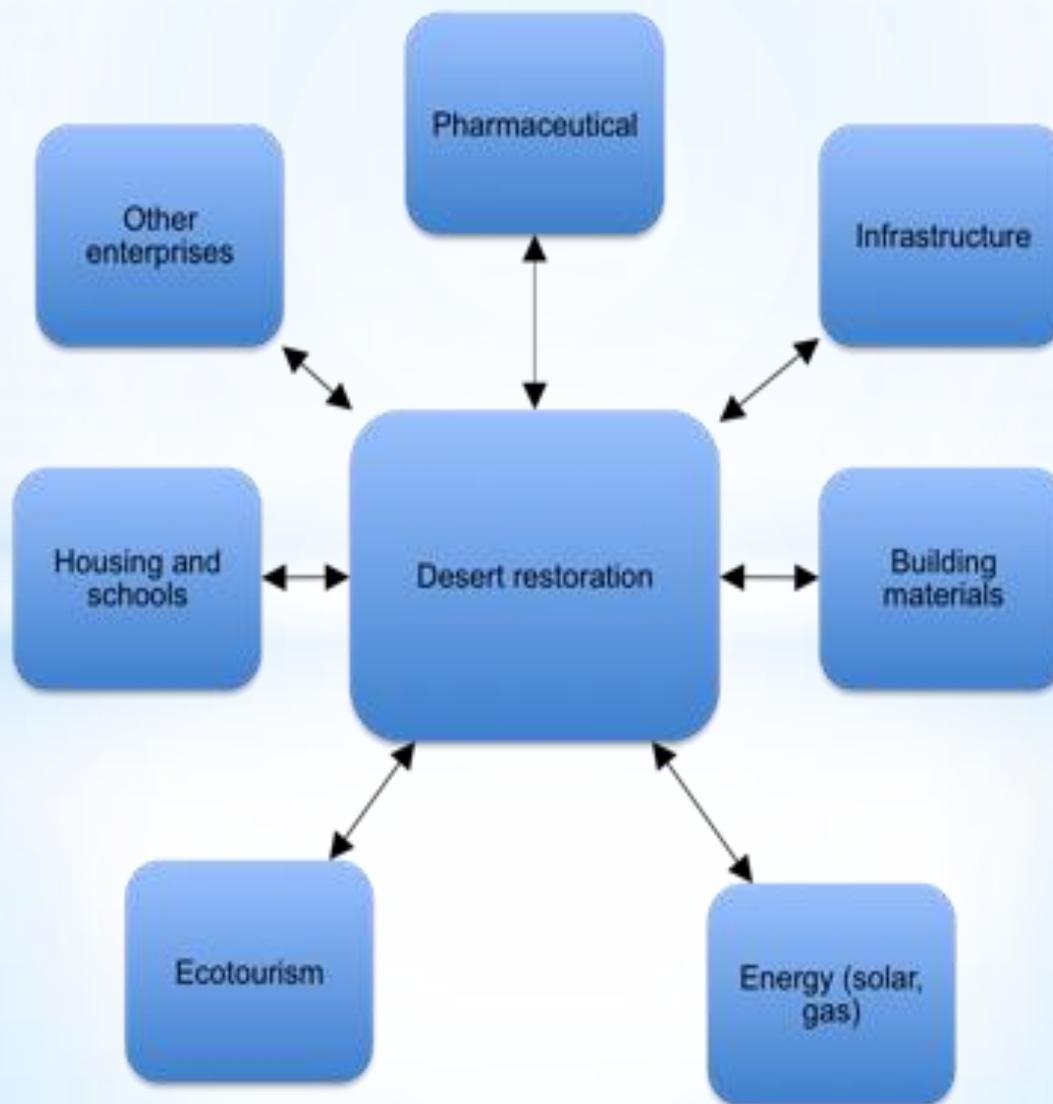
Greenhouse technology

- **Production economics**



The planting of liquorice  
and range of other types of xerophytes

# Enterprise interactions



- **Development of industries**

## **Infrastructure**



- **Development of industries**

## Pharmaceutical



- **Development of industries**

## Building materials



- **Development of industries**

## **Energy**



- **Development of industries**

## Desert Eco-tourism



## **The Elion conceptual model of green sustainable development is expressed by two cycles:**

1. A social cycle of desertification prevention control, industrial development, livelihood improvement, ethnic harmony, and harmony between nature and people;
2. An economic cycle of desertification prevention and control, eco-restoration, land reclamation, and industrial development.

## ■ **Public-Private-Community partnerships**

- \* Since 2000, enterprises have replaced elite households as the main investment force in sandification prevention projects under the government's pro-enterprise policies.
- \* The community of over 100,000 farmers and pastoralists have been one of the largest beneficiaries of Elion's green economy activities through various means, including renting land, becoming shareholders, and developing activities such as tourism, and forestry and farming.

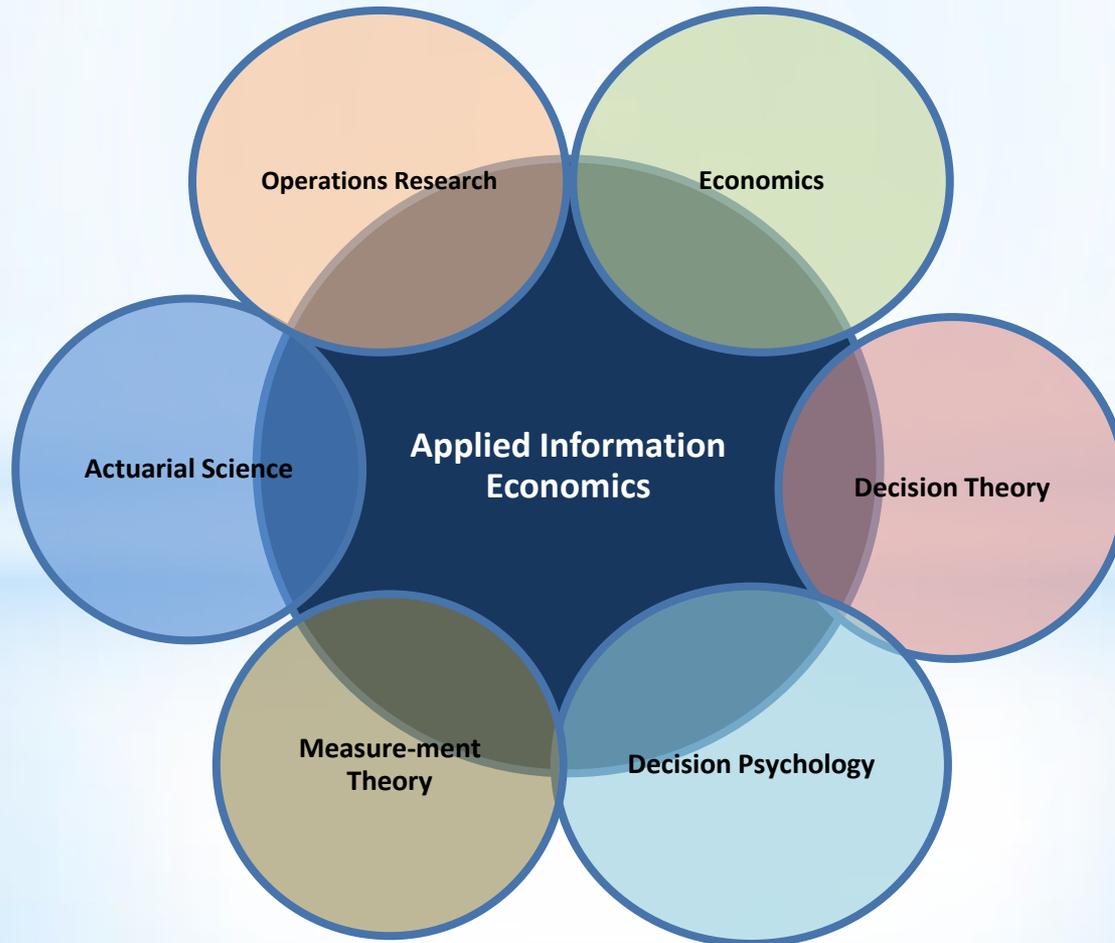
## ■ **Public-Private-Community partnerships**

- \* **Trainings:** The initiative in Ordos has conducted over one million person days of training of ecological reconstruction workers and catalysed collective action by local farmers, the community and private companies in desert ecological restoration.
- \* **Investment:** Private companies now implement 90% of the afforestation in Ordos, and Elion's investment has become relatively minor.
- \* **Science:** Partnerships with scientific research institutions

# Public-Private-Community partnerships

- \* Government provides the public authority;
- \* Social communities provide labour and guide collective community action;
- \* The enterprises provide the economy and market forces

# Assessment of the Kubuqi Model



Major Components of Applied Information Economics

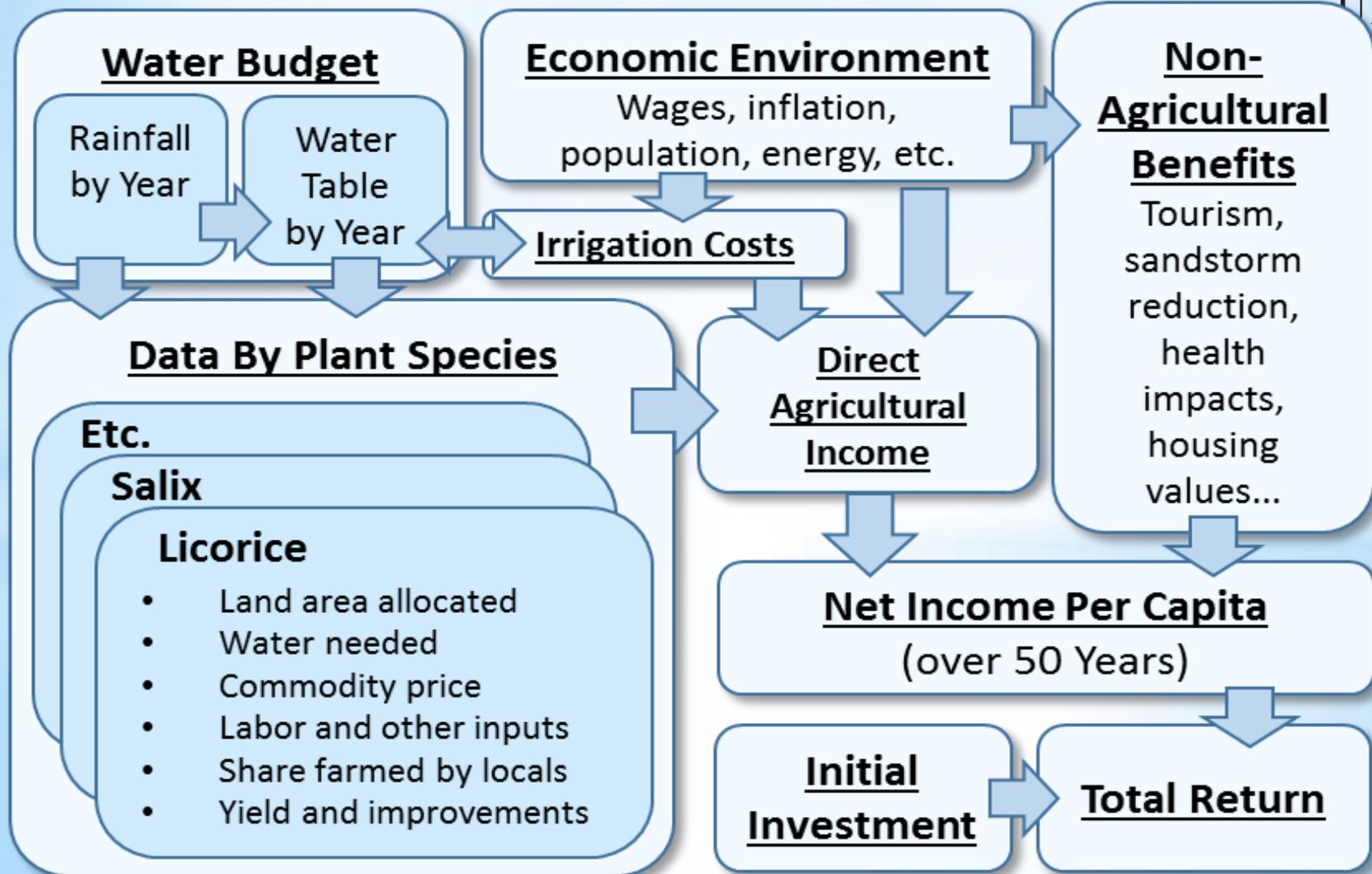
## ■ **Basic Structure of the Impact Pathway**

### **Inputs Section**

- Economic Environment
- Water Budget
- Irrigation
- Properties of Plant Species
- Initial Investments
- Non-Agricultural Benefits

### **Additional components in the Cash Flow Section:**

- Direct Agricultural Income
- Net Income per Capita
- Total Return



# Environmental impacts

## On-site environmental impacts

Wind and sand movement

**Soil health**

Hydrological impacts

## Off-site environmental impacts

*Dust storms*

*Biodiversity*

*Climate and soils*

# ✓ Conclusions and Recommendations

- **Risks of Kubuqi desert green economy model**
- **Implications for other desert greening projects**
- **Considerations for scaling out desert green economy**

## ■ Recommendations from the modelling

- 1. Consider greening for similar deserts.**
- 2. Develop a more comprehensive model of the interactions of hydrology and plant physiology.**
- 3. Monitor the water table level and irrigation usage on an annual basis.**
- 4. Further expansion decisions should be taken only if better water table tracking and a more detailed model support it.**

## ■ Risks

- **Hydrological risks**
- **Other risks**
  - Increased soil salinity or alkalinity
  - steady increase in temperature
  - Species genetic diversity
  - Climate Change

## ■ Implications for other desert greening projects

1. The Kubuqi Desert is not as dry as some desert locations in the world.
2. water consumption in part by using a large proportion of species native to the desert and then only developing a portion of the total area.
- 3 could make straightforward empirical measurements of water table levels and irrigation water usage to reduce uncertainty.
4. A long-term commitment is necessary. Whatever the source of funding, the wait time for significant benefits will be in the order of decades.
5. Public subsidies may be justified.

## ■ Considerations for scaling out desert green economy

1. Make productive use of indigenous germplasm and related knowledge, combined with technological innovation.
2. Ensure access to a sustainable water resource for supplementary irrigation and use efficient irrigation technologies.
3. Develop industry around the utilization of tree and desert plant products.
4. Manage the project to minimize and carefully manage the area under fast-growing trees and exotic and high values crops that have large water demands, to reduce water consumption, and maximize the area under indigenous vegetation with low water demand.

# Review of the Kubuqi Ecological Restoration Project

A Desert Green Economy Pilot Initiative



**THANK YOU**

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