

## **Drought Management: a multi-level governance approach in rural China**

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### **Intro**

Drought has always been a serious problem in many parts of the world, and climate change may further exacerbate this problem. Much literature is available on providing information on drought instruments in rural China covering establishing national drought relief (**Zhang et al., 2005**) and water scarcity management systems (**Qu et al., 2010**), promoting water saving and agricultural technology (**Huang et al., 2009; Blanke, et al., 2007**), analyzing Water Users Association (WUA) (**Wang et al., 2010**), initiating water pricing measures (**Yang et al., 2003; Zhong and Mol, 2010**), popularizing agricultural subsidies (**Du et al., 2011**), and experimenting with policy-oriented microfinance and agricultural insurance (**Du, 2003; Zeng and Mu, 2010**). But very few has addressed the issues on multi-level governance in this area in general, and in China in particular. This paper focuses on the question: How can an examination of institutional and non-institutional causes of drought and the performance of existing instruments at multiple levels of governance help us to develop more appropriate policy instruments for drought management in China?

### **method**

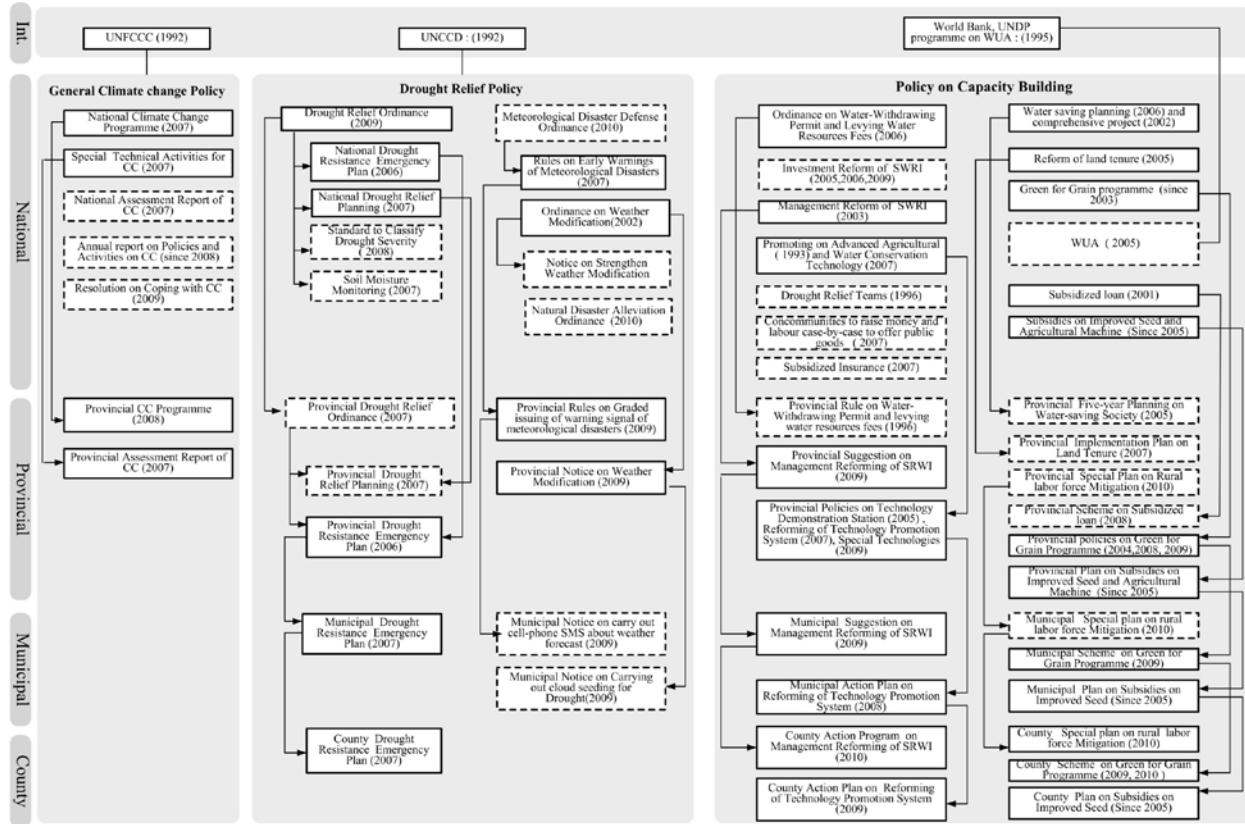
In doing so, the Oran Young's institutional analysis framework (**Young et al. 1999, 2005**) is adopted to, first, analyze institutions (organizations and policies) at global, regional, national through to local level; second, analyze the incentives embodied in these institutions; third, analyze the driving forces that affect drought; fourthly, analyze the effectiveness of policies on actors, given (i) the existing autonomous actions taken by actors, and (ii) the drivers influencing the problem; fifthly, based on the analysis of the contextual effectiveness of policies and the needs of the farmers, we propose a redesign of instruments at multiple levels of governance.

Taken the Upper Mekong River Basin in the Yunnan Province as case study area, firstly, 93 policy documents, including 39 documents at national level, 22 documents at provincial level, 22 documents at municipal level and 10 documents at county level, have been analyzed from the perspective of governance. Secondly, a household survey has been conducted in 6 natural villages in this area.

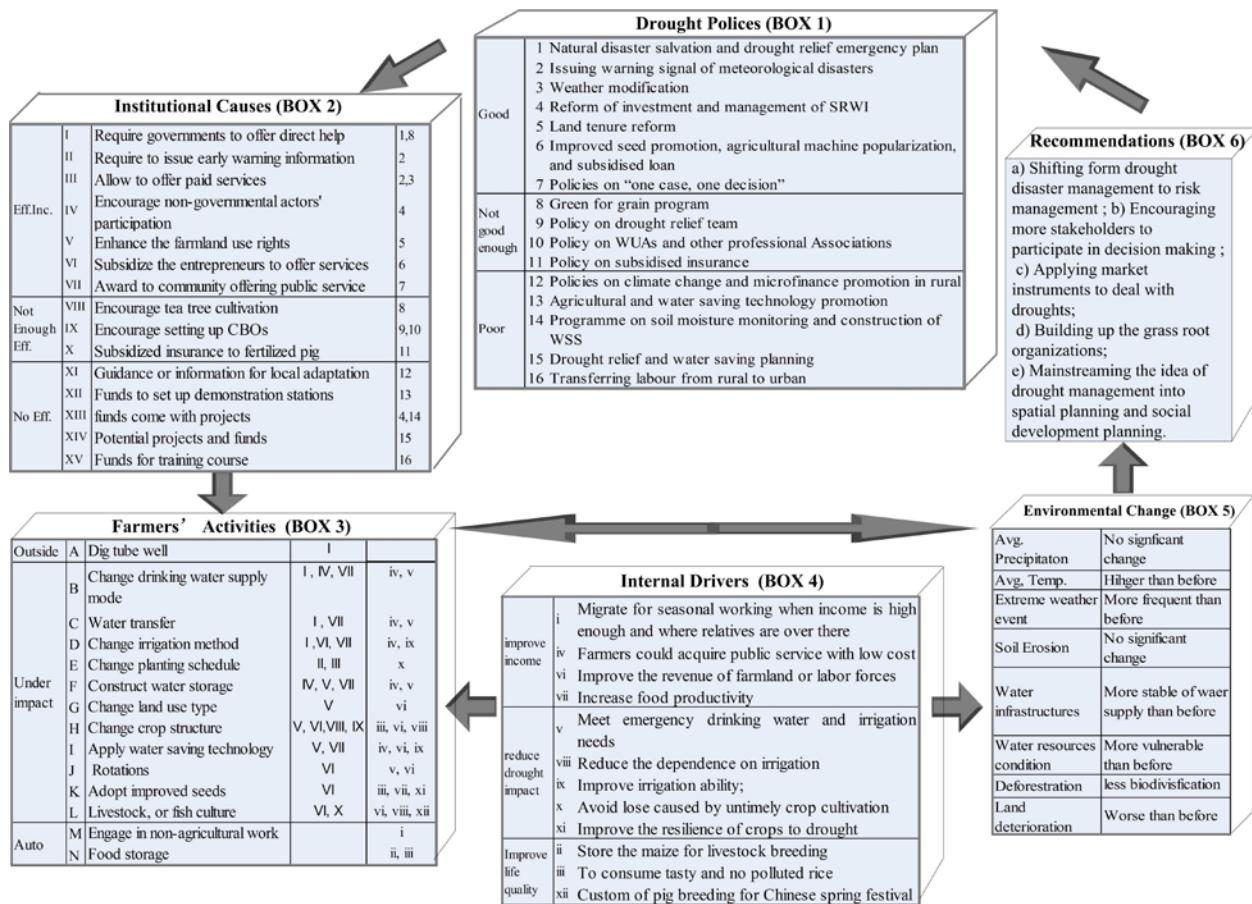
### **Policy framework**

The drought policies in China could be categorized into three groups, which are a) general climate change policies, b) drought relief policies, and c) adaptive policies. The general climate change policies have offered guidance or direction on coping with climate change which includes drought disaster. Drought relief policy aims to resolve the actual drought hazard or very possible drought risk faced by us.

It is usually implemented by government directly with the purpose of helping victim out of disaster. box 1



The adaptive policy aims to improve the ability of local people to cope with drought. Contrary to drought relief policy, it aims to change the rules of behavior and social pattern to improve ability of local people. It has more far-reaching influence on inhabitant's ability to cope climate risks, but sometimes it's time costing and inefficient. (See figure 1 and BOX 1 in figure 2)



**Figure 2 Applying the Institutional Analysis Model to Drought Policy in China**

### **Institutional incentives**

Regulatory incentives included in drought policies include guidelines, administrative permits, enhancement use rights or property rights and legally binding obligations Economic incentives include government funds, subsidies and awards. In addition, beneficiaries make payments for drought relief services provided by non-state actors and Drought Relief Teams. Also There are five types of financial arrangements included (a) direct and full subsidies from the central government, (b) joint funds from central and local governments, (c) funds from the local governments, (d) cost by beneficiaries and the local government; and (e) funds only from beneficiaries' payments.

Combined the relationships showed in BOX 1 and BOX 2 with household survey results, it could be found that (a) policies with identified financial arrangements could be implemented more effective while polices with no identified incentives give more space to local government; (b) the effective of policies with fund depends whether local government or people could obtain them; (c) policies involving non-governmental actors or CBOs and undertaking market measures will be in favor of their success.

### **Farmers' activities (BOX 3)**

According to the household survey, several activities have been taken by farmers to deal with drought, which include dig tube well, change drinking water supply mode, water transfer, change irrigation method, change planting schedule, construct water storage, change land use type, change crop structure, apply water saving technology, rotations, adopt improved seeds, fed livestock, or fish, engage in non-agricultural work, food storage.

Linking with the institutional analysis, there are about 10 kinds of incentives implied in 11 policies playing role in farmers' activities(See BOX 3 in figure 2). The incentive I regulates local governments to offer farmers with infrastructure, device and even public information for drought relief, showing direct help is still important drought management measures. The functions of Incentive II and III indicate early warning system involving local company could help farmers preparing for drought by change crop planting schedule. Although the incentive IV could not solely play role in offering public goods, it can facilitate or amplify government's ability to do it. The incentive V improves revenue of farmlands through assembling small plots into big one, which causes cost decreasing of unit plot to construct infrastructure or apply water saving technology. The incentive VI encouraging participation of local entrepreneurs has influenced four kinds of farmers' activities greatly. The incentive VII awarding community members to offer public goods have played good roles in five kinds of farmers' activities. Contrastingly, the incentives VIII, IX, X only occasionally help farmers fed livestock and change crop structure in an unpopular way while the incentive XI to XV could not be found in function at local level.

#### **Comparing internal drivers to external causes (BOX 4)**

The internal drivers could be categorized into improving income, reducing drought influences, and improving life quality. It could be found that (a) only the activity M is special for improving incomes; (b) only the activity E is undertaken specially for drought; (c) the activity G, N are undertaken specially for life quality; (d) the activity B,C, D, F are adopted to both improve income and reduce drought influence; (e) the activity H, J, L are for both reduce drought risk and improve life quality; (f) the activity I, K are for all three purposes (See BOX 4 in figure 2). Therefore, if external causes match internal drivers well, the policies could be implemented effectively, and vice versa. For example, the government tries to help farmers to seasonally migrate to urban for jobs through offering training courses, while farmers consider more on income and convenient, which led to unsuccessful policy implementation at local level.

#### **Environmental Change (BOX 5)**

The deterioration of water infrastructure and less ability of offering public goods also will be another reason of drought hazard. At regional or local level, deforestation and soil erosion are also important drivers to regional drought.

The research results shows that the policy have (a) successfully improved the water infrastructure; (b) successfully improved farmers' income; (b) stabilized water supply through agriculture machine popularization; (c) partly curbed the expansion of deforestation and soil erosion. But the degree of water resource utilization, land resources cultivation is increasing while the biodiversity in this area is decreasing very quickly, which all challenge future policy making.

## **Policy recommendations box 6**

In order to address aforementioned challenges in drought policies, several new strategies should be taken, which include (a) shifting from drought disaster management to risk management which depends less on government's financial ability and infrastructures construction; (b) encouraging more stakeholders to participate in decision making which emphasizes the function of local knowledge; (c) applying market instruments to deal with droughts; (d) building up the grass root organizations to mediate between governments and farmers; (e) mainstreaming the idea of drought management into spatial planning and social development planning.

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