Governance mechanisms for sustainable consumption and production in China

(draft version)

Patrick Schroeder

Affiliatione: China Association for NGO Cooperation (CANGO)/
UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)

Abstract

China has been the fastest-growing major economy for the past three decades with an average annual GDP growth in excess of 9%. It now has the world's second-largest manufacturing sector after the United States and is the world's largest exporter of goods. It is also home to a fast growing urban consumer class and over the next two decades China will not only be the "world factory", but also become the world's consumption hub.

The discussion of SCP in China has so far mostly focused on cleaner production with an emphasis on technical end-of-pipe solutions to contain industrial pollution and address the intensity of industrial energy consumption. With rising incomes sustainable consumption issues and discussions are gaining increasing attention.

In this paper a four quadrants analysis framework (consumption, production, top-down, bottom-up) is applied to discuss effectiveness of governance approaches for SCP in China. Several case studies promoting SCP patterns, which reflect some of the different governance approaches currently used in China, will be presented. The cases are analysed according to their effectiveness, the actors and stakeholders involved, SCP instruments applied and governance processes employed.

The case studies demonstrate that changes in governance approaches are necessary to make progress towards cleaner industrial production and promotion of voluntary sustainable consumption choices. Particularly increased public participation in decision making processes regarding environmental impacts assessments of industrial facilities, infrastructure developments and public access to environmental information. An increased role for civil society acting as watchdog of industrial polluters and initiating social debates on China's future development pathway will be an important element for effective SCP governance. Regarding solutions to unsustainable consumption patterns, China's governance approaches are unique in so far as they allow rather effective restriction on high-impact consumption.

1 Introduction

The discussion of SCP in China has so far mostly focused on cleaner production, with an emphasis on technical end-of-pipe solutions to contain industrial pollution and address the intensity of industrial energy consumption. For good reasons: the impacts from unsustainable production practices are causing heavy damage to environment, society and economy. According to the China Green National Accounting Study Report 2009, the degradation of the environment caused by industrial pollution and resource extraction is estimated to have incurred an economic cost of 1.4 trillion Yuan ($222 billion), an increase of about 9.2 percent compared to the previous year 2008 (Zheng, 2012).

China's resource consumption has likewise increased dramatically over the last decades, driven mainly by China's rapid industrial growth. For example, China's water use has increased by 12.4 percent between 2000 and 2010 (China Statistical Yearbook, 2011), mainly through water consumption from industry and mining activities. China's per capita ecological footprint increased from about 1.5 global ha/person in 1992 to 2.21 global ha/person (Ewing et al., 2010) while China's biocapacity continued to decline. In terms of pollution, China's first official nationwide census of pollution sources issued in 2010 found that pollution levels are much higher than official government sources indicate: In 2007, industrial solid waste such as particles from mines or steel mills totalled 49.14 million tons, the amount of pollution discharged into water resources totalled 30.3 million metric tons and waste gas emissions topped 63.7 trillion cubic meters (Xinhua, 2010).

By 2020, some 850 million people, representing about 60 percent of the total population, will be living in China's urban areas, up from about 650 million in 2010 (Atsmon et al., 2012). Along with the urbanization processes, China's has witnessed significant changes in the production and consumption systems with significant impacts on resources and ecosystems. Regarding food production and consumption, a sharp decline in arable land in the past 20 years has been observed. However, grain output increased from around 450 million tons in 1992 to around 550 million tons in 2010 due to the extensive use of chemical fertilizers which shows a rising trend in the past 20 years from just under 30 million tons in 1992 to more than 55 million tons in 2010 (China Statistical Yearbook, 2011). Large-scale use of chemical fertilizers not only increases energy consumption but also has a negative impact on the environment, causes pollution of groundwater and soil compaction. In addition, as Chinese people's living standards improve and diets change, the consumption of high impacts products such as meat, dairy, aquatic products and seafood shows strong increases over the past 20 years.

China's private household consumption trends have mostly not received much attention by policymakers or the public. Although ecological per capita footprints and carbon emissions, 5.8 tonnes CO2/person (EIA, 2011), are still much lower than those of OECD countries, these figures hide the fact that China's rural population has much lower footprints and emissions than urban consumers. In terms of private household consumption, the gap between rural and urban incomes is also reflected in consumption patterns. Especially in urban areas the use of private motor vehicles and rising consumption of luxury products are major trends of unsustainable consumption patterns. In 2009 China surpassed the US as largest car market and in 2010 China became the world's second largest luxury market.

Household consumption patterns require much more attention as it will pay an increasingly important role in the Chinese economy. In the coming decade consumption, rather than investment, will be the major driving force for China's economic growth. According to Atsmon et al. (2012) consumption will account for 43 percent of China's total GDP growth by 2020, compared with a forecast contribution from investment of 38 percent. Mainstream consumers with an annual disposal income between $16,000 and $34,000 will make up 51 percent of urban households in 2020 and affluent consumers with annual disposal incomes above $34,000 will rise to 6 percent.

In contrast to the shortcomings in implementing industrial pollution control, for the control of unsustainable consumption patterns a range of top-down governance approaches are already being applied and strictly enforced, in some cases quite successfully. Regarding promotion of sustainable consumption patterns government-led public awareness raising campaigns, and those by civil society, show only limited success in encouraging voluntary sustainable behaviour, Chinese consumers are much more willing to accept limitation to personal material consumption set by government policies. However, these restrictions on consumption are not always equally distributed and privileged social groups are often able to maintain their high-impact consumption patterns. An example is the restriction on the sale, registration and use of private passenger vehicles in cities like Beijing and Shanghai.

2 Governance mechanisms for SCP

Governance issues for SCP with a particular focus on sustainable consumption are receiving increased attention in developed consumer societies. The governance mechanisms that need to be applied underline the importance of actor networks, multi-stakeholder initiatives, an enhanced role for civil society participation, the need for social innovations that go beyond technological fixes and, maybe most importantly, strong regulatory frameworks (e.g. Lorek and Fuchs, 2011)

Currently, environmental governance in China is focusing on addressing the most pressing issues of industrial pollution and energy consumption. However, environmental governance mechanisms are not working effectively to address these issues, even those problems that can be addressed through technological end-of-pipe solutions are facing many obstacles. The complexities of increasingly unsustainable consumption patterns and overconsumption will pose additional challenges in the coming decades. This will be of particular importance as China tries to increase domestic consumption demand as driver for economic growth to reduce reliance on overseas export markets for future economic development (Li, 2012).

According to the Task Force on Environmental Governance of the China Council for International Cooperation on Environment and Development (CCICED), participation by civil society through transparency of information, greater policy coherence and planning capacity, and engaging the business sector as key issues that should be addressed. More specifically, it is considered necessary to improve the government's capacity to enforce environmental laws and oversee the implementation of environmental programmes, to enhance the government's capacity to control environmental pollution, and to improve the management of natural resources. Furthermore, engaging the business sector to take a more proactive role in environmental management by providing incentives to those that perform well and punishing those that do not (CCICED, 2006).

Innovative governance mechanisms will be important to make progress towards sustainable consumption and production patterns in China. Interestingly, the Chinese government already does try to address unsustainable consumption through strong regulatory measures in a top-down fashion, such as the restriction on private car purchases and use in large cities like Beijing in Shanghai. In the remainder of this paper a four quadrant analysis framework (consumption, production, top-down, bottom-up) is introduced and applied to present several case studies. The analysis framework can be further divided into governance approaches which either restrict unsustainable consumption or production patterns or promote SCP patterns. In China currently top-down governance approaches are most successful in restricting unsustainable consumption practices, to some degree successful in restricting unsustainable production (pollution control caused by industrial production). However, top-down governance is less successful in encouraging sustainable production practices such as through innovative business models or eco-industrial practices. In enabling sustainable consumption and lifestyles top-down approaches

have so far not been very successful either. These shortcomings of government action are partly compensated by bottom-up initiatives on local level by civil society initiatives and small community-based business models which show some success in promoting localized sustainable consumption and production systems (see Figure 1).

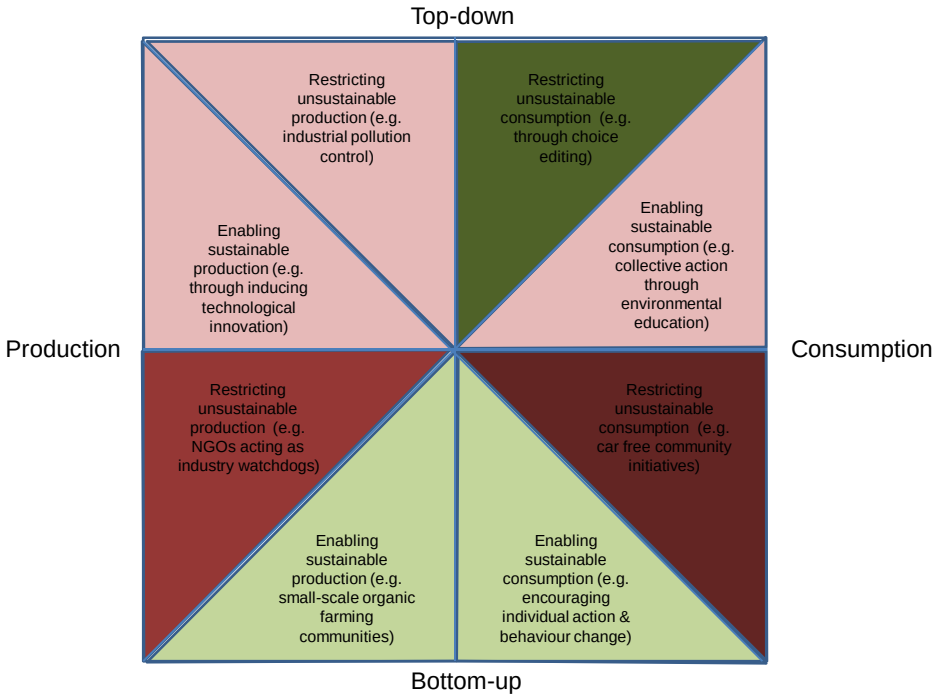

Figure 1: Effectiveness of governance approaches in China for sustainable consumption and production (note: colours dark green to light green indicates degree of effectiveness, colours dark red to light red degree of ineffectiveness) (source: authors assessment)

Through this framework the different governance approaches currently being used in China can be classified. The four cases presented will be analysed according to their effectiveness, the actors and stakeholders involved, SCP instruments applied and governance processes employed. The case studies will cover the following issues:

1. Municipal government action to reduce congestion and urban air pollution through restrictions on sales, registrations and use of private passenger vehicles in the cities of Beijing and Shanghai (Top-down governance restricting unsustainable consumption).
2. Changing urban mobility patterns through coalition building and NGO network action raising awareness and promoting innovative approaches to low-carbon mobility (Bottom-up governance enabling sustainable consumption)
3. Coalition of farming community and civil society organisations enabling ecological food production and sustainable livelihoods in rural areas of Sichuan (Bottom-up governance for sustainable consumption)
4. “Voluntary agreements” of the Top-1000 enterprises industrial energy efficiency programme of the 11th Five-Year Plan (Top-down governance for sustainable production)

3 Top-down consumption governance: restricting unsustainable urban commuting behaviour

In the consumption area of urban mobility, top-down instruments restricting unsustainable mobility patterns in urban centres have become necessary, for example the regulations restricting use of private passenger cars. A number of major cities in China have implemented car use restrictions, for example Beijing, Shanghai, Hangzhou, Lanzhou, Guiyang and Changchun. The most recent city which announced the introduction of car use restrictions is Chengdu in Sichuan province, with 2 million cars ranking number three behind Beijing and Chongqing.

In Beijing, the restrictions were initially introduced in the run-up to the Olympics in 2008, as a temporary regulation which was extended twice, the last time in April 2010 for two years. In early 2012 the policy measure was adopted as a long-term transport strategy. Beijing's car owners are prohibited from driving one day each week, the day being determined through the last digit of their license plates. The restriction in principle keeps more than 800,000 cars, or about a fifth of the city's 5 million cars off the roads from 7 a.m. to 8 p.m. every weekday. Research on the effectiveness of the measure (Wang et al., 2010) shows that traffic congestion was reduced and air quality has improved. The restriction is generally accepted by the public as a necessary measure to reduce congestion; however, environmental concerns such as air pollution are only a secondary consideration in supporting the restriction, the main concern is congestion. Despite the relative short-term success of the measure, some unexpected developments which run counter to the restriction have emerged. Many households purchased a second or third car to be able to drive on all days of the week. Other existing policies are also potentially counter-productive, an example is the Beijing Municipal Government’s adoption of policies to stimulate the purchase of private vehicles, such as the provision of mortgages for vehicles and the reduction of relevant fees for vehicle use (Liu et al., 2007).

In addition the number plate regulation, as a reaction of the municipal government to increasing car ownership, as of 1 January 2011 a new regulation has been put in place that restricts the registration of new vehicles in Beijing. To be able to purchase and register a vehicle, residents must participate in a lottery system first. In 2011, there were only 173,000 new vehicles registered, 617,000 less than the number in 2010. By the end of 2011, the total amount of the city's registered vehicles had reached 4.98 million, As of February 15th 2012 there were 5.017 million cars registered in Beijing. In 2010, the average monthly increase in registered new cars was 66,000, without restrictions the total number of cars would have reached the 5 million mark in March 2011 (Xinhua, 2012)

In contrast to Beijing and other cities, Shanghai already introduced measures to control numbers of cars as early as 1994 through an auctioning system for number plates. From 1994 to 2008, more than 15.55 billion Yuan had been collected from the car plate license auctions. A license plate for a private car in Shanghai can cost about 100 times as much as one in Beijing, judging by a November 2010 auction in which 13,429 bidders competed for 8,500 license plates. The average price for a license plate at the auction was 45,291 Yuan (Wu, 2011). While the lottery system has helped to control the number of cars at around 1 million vehicles by end of 2011, it is socially problematic as it gives advantages to wealthy households.

While the car restriction policies have been implemented in a top-down fashion without little public consultations or involvement of the public, the measures are generally accepted by the Chinese public. Chinese urban consumers seem to show willingness to sacrifice personal consumption for the overall benefit of society, but only if the measures are accompanied by strong enforcement mechanisms.

4 Bottom-up consumption governance: encouraging sustainable private mobility

In terms of bottom-up governance, Chinese civil society initiatives promoting sustainable urban commuting or low-carbon lifestyles in general try to address these issues by coalition-building. An example is the Green Commuting Network[1] established by the China Association for NGO Cooperation (CANGO) and the Environmental Defense Fund which cooperates with organizations in more than 20 cities across China. Furthermore, it makes use of high-profile events to raise the visibility of the programme.

Beginning in 2006, initiated by the China Association for NGO Cooperation and the U.S. Environmental Defense Fund, the "Green Commuting Network" was established. It is a successful example of how NGO initiatives can through cooperation with research institutes and engagement with the private sector attract the attention and support of the government, thereby increasing effectiveness and influence.

The network's projects were initiated with a study on the impacts of urban air pollutants on human health. The following initiatives were designed with the purpose to improve urban environments for healthy communities, rather than focusing on abstract issues such as climate change. In order to reduce urban air pollution, the projects aimed at raising public awareness in 20 major cities, introduce sustainable commuting practices such as cycling and use of public transport and provide policy recommendations.

In order to strengthen public participation, the 2008 Beijing Olympic Games provided a window of opportunity to cooperate more closely with Beijing municipal government. The Green Commuting Network and the Traffic Research Institute of Tsinghua University launched a green travel carbon calculator during the Olympic traffic restrictions. Furthermore, the engaged with companies which pledged to reduce emissions from their employees commuting practices. In total 70 organisations and 81, 640 individuals to participated, making personal pledges which reduced a total of 8895 tons of carbon dioxide emissions. In August 2009, a Shanghai auto insurance company bought 8026 tons of these avoided carbon emissions as offsets for their company's commuting emissions. This transaction led to the establishment of the China Green Commuting Fund in 2010 which continues to work on providing voluntary offset projects.

The Shanghai Expo and Guangzhou Asian Games were also used as platforms for a variety of green commuting project activities which involved schools, communities, the introduction of a low-carbon public transport card, tree planting. Many of these activities also involved support and participation of central and local governments.

This case demonstrates that support from international NGOs and think-tanks is important to make bottom-up initiatives work in China. Challenges for Chinese NGOs in promoting sustainable consumption include effectively engaging companies, reaching out to a wider public audience and the restricted political space provided by current regulations which limits the impacts of their campaigns. Civil society approaches form an important contribution to sustainable consumption governance addressing affluent, over-consuming population groups in urban centres. However, as in developed consumer societies, they do not suffice to solve system-wide problems, e.g. lock-in of urban transport infrastructures or social values regarding private car ownership.

[1] Information about the Green Commuting Network was provided by CANGO project management staff.

5 Bottom-up production governance: ecological food production and sustainable livelihoods

The Anlong Village Model[2] community is a complex interrelated programme that has been running since 2005, located about 30 kilometres to the west of Chengdu city, Sichuan province. The programme is managed by the Chengdu Urban Rivers Association (CURA) with financial support by international and private donors, including WWF. CURA's overall organisation mission is to reduce the water pollution in the local rivers around Chengdu. In CURA's early days, the organisation knew that non-source pollution from farm run-off was the major pollution going into the rivers as industrial effluents had been largely taken care of by the Chengdu government in an earlier project in a top-down fashion. However, run-off from small farms was not addressed by government action. CURA devised a plan to work with the farmers to change their practices from using environmental-destructive petro-chemicals to going ecological. The practice is the same as but technically not organic, as this would require certification, which is available in China, but is too expensive for small farmers. The newly introduced ecological farming practice is not traditional farming either as the traditional ways were carbon intensive, especially when farmers burnt their fields at the end of the growing season. This no longer happens as the waste is now considered compost which generates bio-gas for cooking and heating.

The project has many components that all work off each other including farming education about ecological farming techniques and why it matters to the environment, their health, and their income. A recycling programme was introduced to recycle as much as possible, including human waste. 160 composting toilets have been installed together with 160 household bio-digesters. Phytoremediation systems have been set up for waste water treatment. Common gardens areas were set up where Chengdu urbanites can go with their families to plant and maintain their own organic vegetable gardens with the help of the local farmers. A public bird watching and environmental education centre was built by the farmers with funding from WWF and oversight by CURA to serve as a platform for environmental education programs to the public. The aspect of eco-tourism was not initially designed but resulted from many interested groups of people going to Anlong to see what is happening. Tea houses, small restaurants and home stays were established. Future models will consider how to use this additional source of income for farmers in a sustainable way. The combination of all the elements above, each of them simple and easily carried out more or less independently by farmers, have been in operation for many years at Anlong demonstrating a sustainable food production practice.

To achieve the transition process which Anlong has been experiencing, complex governance processes evolved involving the input of numerous stakeholders, including local food processing businesses which have strong interests in ecological food. Local government has not always been supportive and at times even interfered with the project. For instance, after its completion the education centre was ordered to be demolished. Only through numerous consultations the local authorities revoked the decision. In early 2012, the local water resources department undertook regulations and straitening of Anlong's natural creeks, without the consent of local farmers, causing significant ecological damage.

6 Top-down production governance: Energy saving in China's Top-1000 companies

One of the key initiatives for realizing China's 20% energy intensity reduction goal of the 11th Five-year Plan (2006-2010) was the 'Top-1000 Energy-Consuming Enterprises Programme'.

[2] Information about Anlong Village was collected through a field visit in April 2012, additional information was kindly provided by Mark Takefman.

The top 1000 industrial enterprises consumed around 0.67 billion tons of coal equivalent (tce) in 2004, accounting for 33% of the total national energy consumption and 47% of the industrial energy consumption. Under the Top-1000 programme energy consumption targets for 2010 were determined for each enterprise. The Top-1000 Enterprises Programme saved 124 million tons coal-equivalent in its first three years (Finnamore and Davidson, 2011).

Although the programme was an agreement between government and industry, the target-setting process was carried out in a top-down way with targets determined by the National Development and Reform Commission (NDRC). The concrete implementation for the five-year period was delegated to the provincial and municipal level. All participating enterprises signed energy conservation agreements with local governments and promised to reach the energy savings target in the five year period. For example, the NDRC signed an agreement with the Beijing Municipal Government covering ten enterprises within Beijing's jurisdiction. The Beijing Municipal Government, in turn, signed energy-efficiency target contracts that include energy saving amounts with each of the ten enterprises (Price, Wang and Yun, 2008).

The energy saving authorities of the respective province, district, or city were directed to collaborate with related organizations to lead and implement the Top-1000 programme, including the tracking, supervision, and management of the energy-saving activities of the enterprises. The local authorities were directed to oversee and "urge" the enterprises in their energy management, energy auditing, and energy reporting requirements (Price, Wang and Yun, 2008).

The programme was not simply executed in a command and control approach as many of the large state owned enterprises are powerful enough to resist such measures. Therefore, the programme also included a number of financial incentives for enterprises. The participating companies were awarded financial support at a rate of 200 RMB¥ ($29) for every tce saved per year for enterprises in East China to 250 RMB¥ ($36) for every tce saved per year for enterprises in Mid or West China. Furthermore, through the support of the UNDP and the EU-China Energy and Environment Programme a number of capacity building trainings on energy auditing and energy management were carried out (Kan, 2008). This resulted in the introduction of full-time or part-time energy managers in more than 95% of the Top-1000 enterprises.

The programme lacked from thorough assessment of potential energy savings, thereby suffered from setting somewhat arbitrary targets that left many potential efficiencies unexploited. This is related to an ongoing problem undermining effective environmental governance - the unwillingness of many companies to disclose information about energy use, pollution discharges and emissions. Despite the shortcomings, the programme is generally considered a success.

7 Overall Conclusions

Environmental governance in China, as in most parts of the world, is still mainly focusing on the production side. China's environmental governance is insufficient in many aspects, particularly industrial pollution control is difficult to enforce as many companies do not comply with existing regulations. The example of the Top-1000 enterprise programme shows that companies can improve their environmental performance if strong targets are complemented with financial incentives and capacity building.

An interesting element of China's environmental governance includes strong top-down governance mechanisms to address and restrict unsustainable consumption patterns of individual consumers. The examples of car restrictions show that top-down mechanisms for restricting unsustainable consumption are generally accepted by the Chinese public. Chinese consumers show willingness to sacrifice personal consumption for the overall benefit of society - if the regulations are strongly enforced.

China needs more bottom-up initiatives for SCP. The case studies presented show that

bottom-up initiatives jointly carried out by civil society, communities and small businesses can be very successful in enabling both sustainable production and consumption on local levels, particularly in rural areas.

In terms of enabling voluntary sustainable consumption choices and behavioural changes of China's urban consumer classes, Chinese NGO activities tend only to reach small segments or sectors of society. More space for civil society to initiate and influence free discussions and societal debate about what direction China's future development pathway should take would be an important element of successful governance for SCP.

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