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on Environment and Development**

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Regionally Balanced and Green Development

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TABLE OF CONTENTS

1 INTRODUCTION.....	3
1.1 Seeking “Balanced, Coordinated and Sustainable Development”	3
1.2 CCICED Theme – 2012 AGM and Phase V.....	4
1.3 2012 CCICED studies	5
2 INTERNATIONAL ECONOMIC CRISIS AND GREEN DEVELOPMENT.....	8
3 CHINA’S REGIONAL DEVELOPMENT.....	11
3.1 Evolution of today’s regional structure	11
3.2 Building a Well-off Society and unbalanced regional realities	13
3.3 Summary observations on unbalanced regional development.....	19
3.4 Causes of regional development imbalances	22
4 SOME KEY ISSUES	29
4.1 China’s environmental decline continues despite vigorous mitigation efforts.	29
4.2 Today’s regional development strategy does not guarantee sustainable development within or among regions.	30
4.3 Mechanisms for differentiated regional green development are still at an elementary stage.....	31
4.4 Industrializing and post-industrialization processes require separate but linked green development approaches.....	32
4.5 Green development coordination and integrated management is limited in effectiveness.....	34
4.6 Lack of a clear long-term vision and strategy to guide national and regional action for green development in China.	35
4.7 Alignment of China’s Green Development with International Green Economy Trends.....	36
5 CONCLUSIONS	37
5.1 Mainstreaming regional Green Development.....	37
5.2 Practical priorities for Green Development	38
5.3 Innovative tools for regional Green Development.....	39
5.4 New Political Opportunities.....	40

Regionally Balanced *and Green* Development¹

1 INTRODUCTION

China seeks to build a society where all citizens will be moderately well-off by 2020. A society in which people and nature can live in harmony. And a nation that will proudly take its place as a key player on the world stage—through its overseas direct investment, its success as a trading and manufacturing nation, and through its contributions to solving global problems including climate change, poverty elimination and sustainable ocean use.

As Premier Wen Jiabao has noted, China still faces a situation of “unbalanced, uncoordinated and unsustainable development.”² Recent analyses have tried to identify how China might turn the situation around by 2030, a time frame of only 17 years from now.³ The economic development results achieved over the past three decades, show that positive changes can be made in remarkably quick order within China. However it is inconceivable that further transformative changes can be accomplished without greater attention to and investment in a new relationship between environment and development. This new relationship will be one that is unprecedented among the world’s nations.

The long-term aspiration has been for China to become an *Ecological Civilization*, a view strengthened at the 18th CPC Congress in November 2012 where this concept, renamed *Ecological Progress*, was elevated to the same level as Politics, Economy, Society and Culture, as one of the main drivers of the whole society.

The congress called for making great efforts to promote ecological progress. We should raise our ecological awareness of the need to respect, accommodate to and protect nature, incorporate ecological progress into all aspects and the whole process of advancing economic, political, cultural, and social progress, intensify protection of the ecosystem and the environment, work hard to build a beautiful country, and achieve lasting and sustainable development of the Chinese nation.⁴

At Rio+20 Premier Wen called for “a green & prosperous world” in his address.

1.1 Seeking “Balanced, Coordinated and Sustainable Development”

¹ This report is the 11th in a series of CCICED Issues Papers produced since 2002. The report has been prepared by the CCICED Chief Advisors, Dr. Arthur J. Hanson and Prof. Shen Guofang with inputs from members of the Chief Advisors Group and especially from Dr. Zhang Shiqiu, who prepared a major analytical report on China’s Regional Development as the basis for sections of this Issues Paper. The views in this Issues Paper are those of the authors. This draft paper may be modified to take into account additional material and comments arising from the CCICED AGM.

² Speech by Premier Wen Jiabao at Stockholm +40 Meeting, Stockholm, Sweden. April 2012.

³ See for example World Bank and Development Research Center of the State Council. 2012. *China 2030. Building a Modern, Harmonious, and Creative High-Income Society*. 448 pp., including Chapter 5. *Seizing the Opportunity of Green Development*; Asian Development Bank. 2012. *Toward an Environmentally Sustainable Future – Country Environmental Analysis of People’s Republic of China*. ADB, Manila. 199 pp.

⁴ Xinhua. 14 November 2012. *Full Text of Resolution on CPC Central Committee Report*. http://news.xinhuanet.com/english/special/18cpnc/2012-11/14/c_131973742.htm

CCICED understands the urgency of today's environment and development situation in China and Asia, in other regions and globally. Thus, as CCICED enters Phase V of its work (2012-2016), the Council will need to consider topics on balanced regional development, coordination needs, and improved policies for sustainable development implementation within China. Furthermore, CCICED also needs to take into account China's international situation on environment and development. The latter point was underscored at Rio+20 in June 2012, where it was very apparent that China efforts will help to determine the success of future international efforts on green growth, green economy and green development.⁵ Domestically, it is the right time for strengthened policies and action for broadening the scope and quality of development, given that the decadal renewal of government is underway.

Fortunately much of the necessary groundwork is in place. Especially with the 12th Five Year Plan (12th FYP), which takes a more sustainable scientific development approach aimed at reducing alarming development gaps among the regions; addresses difficult and worsening pollution issues such as NO_x, and soil pollution; and places greater emphasis on quality of life in both cities and countryside. But the fundamental issue of uncoordinated development remains at the heart of many difficulties faced in China.

The economic juggernaut model of development in Eastern China is gradually shifting to other regions and in particular to the very large Western China Region, raising the spectre of repeating past patterns of high pollution and profligate energy use in new development locations, or even repeating past bad domestic practices in some locations abroad where China private sector investors are active. Now instead of major provinces in Eastern China leading GDP growth, it is provinces in the west. It is not certain that these western provinces and autonomous regions will be able to meet energy and pollution targets.

All parts of China require a new model of development that will be "greener", will place greater emphasis on domestic consumption, and will set priorities that "put people first." Of course there can be no "one size fits all" approach. These are dilemmas of balancing regional development, and in designing differentiated regulatory and incentive systems that are also fair and workable.

1.2 CCICED Theme – 2012 AGM and Phase V

At this year's AGM, CCICED examines Regionally Balanced and Green Development. The choice of wording is very deliberate. One can consider a range of unbalanced development situations in regions of China at the present time, but ultimately all must be transformed into environmentally, socially and economically sustainable forms of development. This will involve many different kinds of actions in both rich and poorer provinces and regions, in the interactions among regions, for example in transfer

⁵ China's overall sustainable progress and its vision for the future have been summarized in its report to Rio+20. *The People's Republic of China National Report on Sustainable Development*. Beijing 2012. 100 pp.

payments such as eco-compensation, and in new regulatory frameworks to take into account integrated management needs such as for China’s marine and coastal regions.

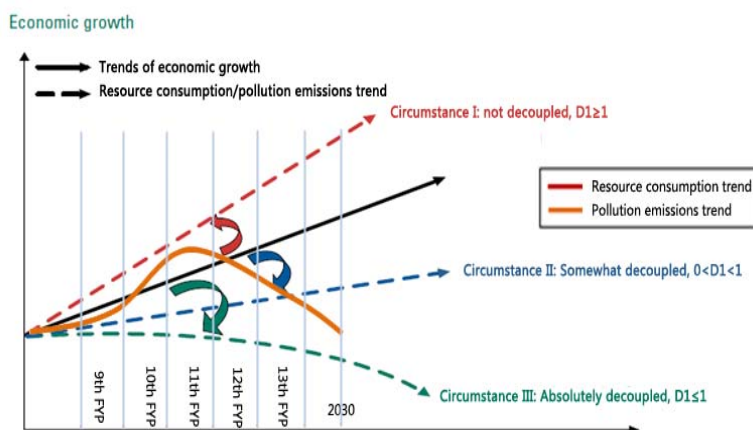
Green Development has taken on greater significance globally since Rio+20 where there was extensive discussions on Green Growth, a concept that gained political traction after the 2008 financial crisis and through efforts particularly on the part of OECD, and on Green Economy, which has been explored in great detail by UNEP, and well-embraced by countries during Rio+20. Green Development is a term favored in China. Indeed, China is as advanced as any other leading nation in its understanding the value of this concept and related approaches such as Low Carbon Economy and Circular Economy. However, serious implementation gaps exist for all countries, including China, for mainstreaming these good ideas into decision-making nationally and locally.

It has been proposed that Green Development be taken as an overall theme for CCICED’s Phase V. Thus it is appropriate for CCICED to explore how Green Development can be more effectively implemented in the various regions of China—in the immediate future and over the longer-term, certainly for the critical decade of 2020-2030. The 12th FYP is a first big step towards Green Development in China.

1.3 2012 CCICED studies

Five CCICED study teams related to regional and green development will report their recommendations during the 2012 AGM. Their efforts are outlined below:

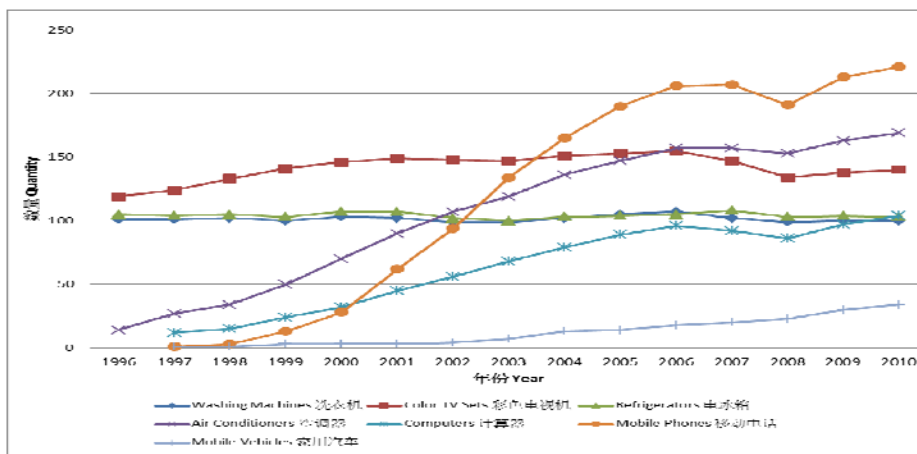
12th Five Year Plan Task Force (12th FYP TF) examined how to achieve mandatory pollution targets of the Plan, with regionally differentiated regulatory needs. The TF also proposed possible environmental protection needs for future Five Year Plan periods, especially for the 13th, 14th and 15th FYPs. This longer-term view underscores the time required to bring complex pollution issues under full control. This TF provides an overarching perspective for the other studies, examining specific pollution control needs for regionally balanced and green development needs in China. The diagram below, from the TF report, illustrates how, nationally, there must be a very major decoupling of resource consumption in order for economic growth to rise and environmental quality to be restored; otherwise environmental conditions will decline from today’s levels.



Western China Green Development TF (Western TF) proposed a roadmap for green development in this ecologically and ethnically complex region of China which is home to most of China’s remaining citizens

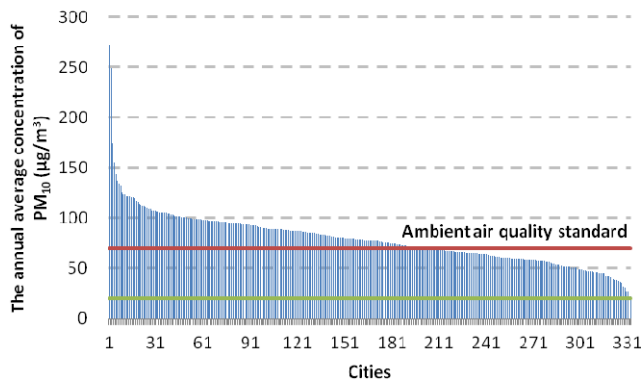
still experiencing extreme poverty, has most of China's desertified areas, is the headwaters of the major rivers of China, and holds most of China's biodiversity in its fragile ecosystems. As a consequence of the Western Development Strategy in place since 1999, expanded investments especially for mining and urban development, and migration of industrial operations from other regions of China is taking place. Ecological protection, green industrialization, sustainable natural resource development for both agriculture and mining, energy use, sustainable urbanization and rural development are key Green Development needs. It also is necessary to have a robust approach to climate change mitigation in this vast region. There are fears that local emphasis on GDP growth could destabilize both ecology and social harmony. This vast region is the most significant in terms of *Main Functional Zoning*, where land and water use zones delineate areas for various levels of protection or multiple use. This promising zoning effort is still at an elementary stage but the initiative highlights the difficult path ahead, since there are major social and economic impacts of any restriction on uses.

Eastern China Development Special Policy Study (Eastern China SPS) was established to consider how the rich eastern coastal region might put in place advanced approaches for Green Development. Some of the sub-regions such as the Yangtze Delta, Pearl Delta, and Beijing are building post-industrial economies in which the service economy will account for more than 50% of GDP. Advanced energy and environmental protection mechanisms; achieving better quality of urban lifestyle; sustainable consumption; green jobs; and greater use of market instruments for achieving Green Development are some of the matters considered by this SPS. Also, how to avoid dismantling and migration of dirty factories to new locations away from richer cities; and how to share environment and development experience from these regions, for example, from major events such as the Beijing Olympics and the Shanghai Expo. The graph below from this SPS report shows the rise in household consumption in Beijing between 1996 and 2010 as illustrated by 7 major items. Clearly some are essential such as refrigerators; others likely could make a positive contribution to sustainable development, for example, mobile phones, and some, including private automobiles and air conditioners, contribute to environmental problems. Multiply the problems of unsustainable consumption within 600 cities throughout China, and the issues of rapid urbanization become very important, especially of the expanding middle class with higher disposable income levels.

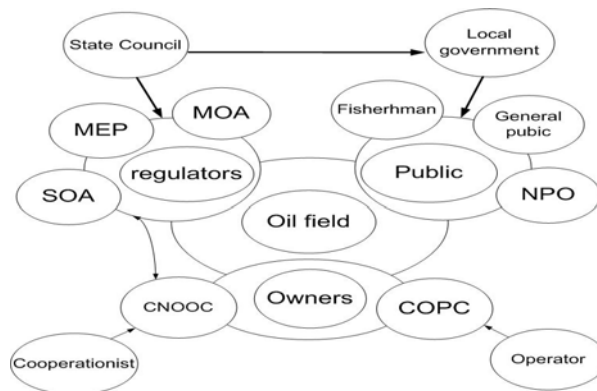


Regional Air Pollution SPS (PM_{2.5} SPS) addressed emerging air pollution problems such as photochemical smog and ozone that have become serious threats even as problems such as SO₂ have been reduced in intensity during the 11th FYP. These new problems are complex since they involve chemical transformation and formation of new compounds, often turning into small particles suspended in the atmosphere (particulate matter, PM). Over the past year there has been considerable public debate over PM_{2.5}, the smallest particles which are particularly dangerous to the respiratory system. These are responsible for turning officially reported “blue sky days” into citizen observed gray days in many cities. Most importantly, no single city can adequately control smog, since airsheds cover large regions. China's serious air quality problems therefore require regional strategy and policies for complex issues such as

PM_{2.5} and ground level ozone pollution control. These emerging problems are still on the rise and likely will require decades to control. This point is illustrated below in a graph from the SPS report, where it is seen that many cities today exceed ambient air quality standard, even for the more controllable pollutants such as PM₁₀. While targets are important, they need to be linked to good regional monitoring information that can demonstrate whether the actual environment conditions (ambient) are getting better.



Marine Oil Spill Prevention & Response SPS (Bohai Oil Spill SPS) examined a 2011 Bohai Bay oil spill associated with offshore oil development. The incident provoked severe reactions on the part of many resource users such as aquaculturalists, with the result that very substantial cleanup costs and compensation payments were required. There is recognition that the Bohai Sea is facing a dismal future unless good environmental planning, management and monitoring is in place, with full cooperation from industries and resource users. In particular, disaster response strategy has been called into question. This study is to give specific guidance on these points and is a very operational follow-up to CCICED warnings provided in 2010 concerning the declining health of this very economically and ecologically important ocean region. The diagram below from a presentation of the Bohai Oil Spill SPS team illustrates a key issue—how to deal with integrated planning, management and emergency response. The actual number of governmental organizations, enterprises and other stakeholders involved is actually much larger than indicated in this summary diagram.



The five studies provide a rich set of examples and recommendations on how to shift towards more balanced and coordinated approaches. In 2011 CCICED examined Green Development in a more sectorally-defined way and at a national level. The 2012 work has drawn upon this earlier work, and takes advantage of other work carried out since that time.

This Issues Paper provides a short review of some current factors influencing economy and environment globally during this past year; gives an overview of the evolution of regional development strategy in China, a complex subject in its own right, plus analysis of how today's four regions in China can be linked to green development strategy; and concludes with several key issues that are challenges to be overcome.

2 INTERNATIONAL ECONOMIC CRISIS AND GREEN DEVELOPMENT

As the financial crisis that began in 2008 continues to ricochet around the world—even threatening the European Union, and slowing anticipated recovery in the USA and certain other countries. The implications for China have been serious. GDP growth has slowed to about 7.5% year-on-year, manufacturing jobs lost, and international trade reduced. There is hope that China might be a kind of savior for the economies of other countries, or as a source of new investment capital. While this hope may be somewhat misplaced, it is clear that China will continue to expand its investment abroad via its now well-established *Going Out Strategy*.⁶ Furthermore, China has expanded the number of bilateral and multilateral arrangements for investment and trade in Asia, the Asia-Pacific Region and elsewhere.⁷ This expansion is helping to rewrite old relationships, and open new opportunities. However, these agreements are not directly tuned into green development or, for that matter, environmental concerns in any systematic fashion.

China's growth continues at a time when much of the rest of the world continues to operate in the shadow of recession. There is widespread worry abroad that sooner or later China could experience much lower growth rates, leading to a downward economic spiral worldwide. This is a simplified view of a complex situation, not completely taking into account all aspects. Notably, China is fostering its domestic consumption, although not with the full-blown approach of the stimulus applied in 2009 and 2010. Also, it does not take into account the major investments made to enhance value-added in China's export products, and the country's innovation efforts designed to open new sectors that could help meet national priorities such as clean energy, while contributing to international sustainable development. Examples are solar and wind energy, and in battery technology.

But it is also apparent that the downturn of economy in other countries and the rise of Chinese share in some of the new technology markets is leading to challenges that threaten some of the new industries. This is particularly the case with complaints recently brought forward to the European Commission, the US International Trade Commission, and the World Trade Organization (WTO) concerning subsidy and trade practices for

⁶ This topic is well covered in the Report of the CCICED Task Force on Investment, Trade and Environment. 2011. *Going Global Going Green*. <http://www.iisd.org/publications/pub.aspx?pno=1615>; also, see http://www.ecfr.eu/page/-/China_Analysis_Facing_the_Risks_of_the_Going_Out_Strategy_January2012.pdf

⁷ See for example, China FTA Network <http://fta.mofcom.gov.cn/topic/enpacific.shtml> , and the China-ASEAN Investment Agreement (2009) <http://www.aseansec.org/Fact%20Sheet/AEC/2009-AEC-031.pdf>

solar and wind energy products manufactured in China for sale abroad.⁸ China has responded with complaints concerning EU subsidies on solar panels and complaints regarding US practices. In addition, there are pressure points on other topics such as the requirement for airplanes flying into EU region airports from other parts of the world to participate in the EU emissions trading system. This action has been suspended temporarily following complaints of a number of large countries including the USA, China, India, and Russia.⁹

The escalation of trade disputes on matters related to important new technologies for green growth and development is unfortunate. Certainly it is not in anyone's best interest to see impediments to the rapid commercialization of environmental goods such as those now being disputed. Price reduction to make these energy sources more competitive against high carbon energy sources is essential. And market size is a primary consideration to make that happen. It is also unfortunate that in the slow movement on Doha Round the issue of exemptions for environmentally beneficial goods is not fully resolved.¹⁰ Therefore there are gray areas that likely will become contentious as seen over the past year.

Despite the disputes centred on renewable energy technologies and other green trade problems described above, progress has been made in recent months by agreeing within APEC (Asia-Pacific Economic Cooperation) to a planned reduction of tariffs to 5% or less for a long list of environmental goods.¹¹ This is seen as a "commitment to pursuing green growth objectives, addressing climate change and securing sustainable economic development".

In the 12th FYP China set out lower targets for annual GDP growth nationally, even though actual performance for some provinces remain in the double-digit level. Growth reductions are a realistic appraisal in the face of international economic downturn, but within China they also are interpreted by government as a focus on quality of development, including pollution reduction, greater energy efficiency and protection of ecological services. However, it is a fine line that must be observed—if growth rates fall too much, job creation worries emerge; and if revenues are diminished, funds needed for environmental protection may be difficult to find, or enterprises may be uncooperative.

Chinese leaders have repeatedly noted that they will not ignore the need for environmental protection, and green development. This is an important statement and there is evidence of its implementation, including the commitments made in the 12th FYP. However, this does not necessarily mean that if a more serious global recession were to

⁸ *US will place tariffs on Chinese Solar Panels*. 11 October 2012 New York http://www.nytimes.com/2012/10/11/business/global/us-sets-tariffs-on-chinese-solar-panels.html?_r=0&pagewanted=print , <http://ictsd.org/i/news/bridgesweekly/134029/> *China-US sparring over renewable energy intensifies*

⁹ <http://ictsd.org/i/news/biores/150032/> *European Commission announces temporary suspension of aviation emissions law*

¹⁰ G. Balineau and J. de Melo. 2011. *Stalemate at the negotiations on goods and services at the Doha Round*. Working Paper/P28. FERDI. 29 pp. <http://www.ferdi.fr/uploads/sfCmsContent/html/112/P28.pdf>

¹¹ http://www.apec.org/Meeting-Papers/Leaders-Declarations/2012/2012_aelm/2012_aelm_annexC.aspx

occur, there would be a repeat of the massive stimulus spending on environment, such as water and sewage infrastructure, at the level seen in 2009-2010. Indeed, as Vice Premier Li Keqiang has said: “*We should insist on protecting the environment while developing, and developing while protecting the environment, actively exploring China’s ‘new environmental protection way’ characterized as ‘small cost, good returns, low emission, sustainable’.* Create a new situation for environmental protection.”¹² This pragmatic approach should be kept in mind while considering issues and policies related to Green Development. In particular, greater attention to outcomes is needed, since meeting pollution targets or other environment targets does not automatically lead to improved ambient environmental conditions, or lower risks to health of people and ecosystems—the desired outcomes.

Concern is expressed that prolonged conditions of global or national recession will lead to a gradual relaxation of environmental regulations and standards. This view was expressed at Rio+20, including the observation that the meeting outcome might otherwise have been much stronger in terms of commitment to Green Economy. In addition, there is a concern that enthusiasm on the part of investors for renewable energy sources and for bringing new sustainable development technologies to commercialization will slow as a consequence of greater exploitation of non-conventional fossil fuel sources such as natural gas obtained by “fracking” of shale gas,¹³ or for other reasons, as biotechnology companies seeking advanced biofuels have found.

China may have advantages in these circumstances. It can invest more in S&T development than most others, and it has potentially large domestic markets. China is improving its capacity to innovate, as measured by patents registered. It is reasonable to believe that China could have significant advantages in moving ahead on sustainable green technologies, even if others fall behind during these lean, recessionary times. This point is a matter of concern for regional development in all parts of the country including Western China—there are many elements of green development such as agriculture and water conservation where there are major innovation opportunities.

The bottom line for many countries, including China is job creation and poverty elimination. There are differing views about the extent to which new green growth strategies and green economy initiatives will produce net employment benefits. Certainly UNEP’s view is the most optimistic view.¹⁴ OECD does not see green growth as being primarily about job creation, but instead focuses on environmental benefits, and transformative change of industry, energy, etc., leading to fundamental industrial ecology shifts.¹⁵ It is quite possible that the situation will be quite variable, according to national, local or sectoral circumstances. The Rio+20 outcome document¹⁶ is backed by solid

¹² Government Net. 20 December 2011. *Speech by Vice Premier Li Keqiang at 7th Environmental Management Conference*. http://www.gov.cn/ldhd/2011-12/20/content_2025219.htm

¹³ <http://news.nationalgeographic.com/news/energy/2012/08/120808-china-shale-gas/>

¹⁴ See UNEP. June 2012. *Building an Inclusive Green Economy for All*. <http://www.unep.org/newscentre/default.aspx?DocumentID=2688&ArticleID=9169>

¹⁵ See *Green Growth and Sustainable Development OECD and Rio+20* <http://www.oecd.org/greengrowth/oeclandrio20.htm>

¹⁶ United Nations. June 2012. *The Future We Want*. Rio+20 outcome document.

analysis that suggests positive employment gains are possible. China could turn out to be one of the best cases in terms of turning green development into net employment gains and for poverty reduction. Certainly green development will be an important driver for creating structural adjustment between secondary and tertiary sectors, with the latter producing the largest share of jobs in the future. This shift will require a very disciplined approach to investment strategy, especially for heavy industry, a point made in current strategic analyses of China's economy.

3 CHINA'S REGIONAL DEVELOPMENT¹⁷

The great regional differences in China's geography and environment, resources, and culture, have been important in its historical pattern of development. As well, over the past sixty years, China has experienced several economic reforms as well as major changes in development policy, especially *Opening Up* in Eastern China. In recent years, various social contradictions, and conflicts created by unbalanced and uncoordinated development have affected social stability, economic growth, environmental and ecological protection, social justice and fairness. To resolve problems both nationally and regionally matters, programs for revitalization and for intensive development have been initiated, for example, in Northeastern China and the Western Development Strategy. Still, these efforts have been ineffective in producing a genuinely sustainable pattern of development, and for some areas income gaps continue to widen, especially between urban and rural populations.

3.1 Evolution of today's regional structure

The modern-day evolution of thought on uneven regional development in China started in 1935 with the famous "**Hu Line**", a diagonal line drawn from China's Northeast to the Southwest, which more or less divides China into western and eastern areas. This line is still relevant today in terms of population density (low in west and high in east), and also in relation to ecological transitions and vulnerabilities.

The line is also relevant to ecological vulnerability and transitions. Landslides, mudslides, and other landform disasters are concentrated along parts of it. The middle part of the line crosses the Loess Plateau, with its erosion and dust storms and main source of Yellow River sediment. The Hu Line is a boundary transiting from waterlogged areas in the northwest region to the flood zone in the southeast, with floods and drought on the east side of the line. This dichotomous pattern was used for planning till the 1980s.

During the 7th FYP (1986-1990), the central government divided the huge inland regions into central and western regions, and producing a clear gradient structure—eastern coastal region, the central inland region, and the western region. This was the period of

¹⁷ This section is a summary of a longer background document included as an Annex to this Issues Paper. They provide an introduction to the complexities of regional development in China. It is written in a narrative style without full referencing. Further information and a longer document in Chinese prepared by Dr. Zhang Shiqiu is available upon request. We wish to acknowledge the valuable efforts of Zhang Shenghao and Wang Peishen in translations from the original document.

rapid development of the eastern coastal areas each having their own characteristics: Liaoning Province relies on heavy industry to promote regional economic development; Jiangsu and Zhejiang provinces, on the rapid development of the private economy; Guangdong relied on the open-door-driven policies.

With the implementation of the Western Development Strategy in 1999-2000, coverage of the geographical scope within the three regions changed. Guangxi and Inner Mongolia were reassigned to the western zone, but the three zones pattern did not change. With the first-mover advantage, the Eastern Region continued to maintain rapid development, and, until recently, the growth rate has been generally higher than in the Central and Western regions. Inter-regional development disparities continue to expand. The resource mobilization capacity of the developed areas comes from the market, whereas within the underdeveloped areas, funds from the market mechanism are relatively small.

The Western Development Strategy is the first regional development strategy formally implemented by the central government. Subsequently, in order to resolve the issue of economic structural changes in resource-based cities and to improve efficiency of state-owned enterprises, the government proposed the strategy of revitalizing the old industrial base in the Northeast Region of China. After that, to balance the regional development and to avoid the collapse of the central region, attention was given to improvements in the Central Region and efforts to accelerate the development of the Eastern Region. Therefore, during the 10th FYP, the pattern of four plates gradually formed.

The 11th FYP proposed an overall regional development strategy, which is *promote the development of the western region, revitalize the old industrial bases in northeast China and other regions, promote the rise of the central region, and to encourage the eastern region to lead the development* as the regional pattern of four plates. The **Eastern Region** refers to 10 provinces and municipalities including Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; the **Central Region** consists of Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan provinces; the **Western Region** includes 12 units—provinces, autonomous regions, and municipalities—Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang; and the **Northeastern Region** refers to 3 provinces—Liaoning, Jilin, and Heilongjiang Province.

The 12th FYP has placed greatest emphasis on the Western Region and also the Northeast, as noted below the China Daily¹⁸ in a report of a State Council meeting in January 2012:

China will continue to boost the development of the country's less-developed western and northeastern regions, according to a statement released after an executive meeting of the State Council...The meeting, presided over by Premier Wen Jiabao, has approved guidelines for the development program of China's west and the revitalization of the northeast old industrial bases in the country's 12th Five-Year Plan period (2011-2015)...The vast western region is still a "short plate" in the country's regional development, and achieving its prosperity is an important but difficult task in the

¹⁸ http://www.chinadaily.com.cn/china/2012-01/10/content_14410199.htm

building of an all-round well-off society.

Priority should be given to the implementation of the strategy of large-scale development of the western region in the country's overall regional development scheme, to maintain its continued stable and rapid economic and social development...Efforts should be undertaken to keep the growth of the regional GDP and the residents' income higher than the national average in the five-year period...More emphasis should be put on the construction of "development priority zones" with their own development focus and priority according to their environmental features, natural resources, current development stage and development potential.

The State Council also underscored the importance of infrastructure construction, environment protection, promotion of advanced industries and agriculture, and the development of small towns and villages, education and opening-up.

The statement said that there were still unsolved systematic and structural problems that have restricted the development of China's northeastern region, and that local governments should continue to deepen reform and accelerate transformation of development pattern in the 12th Five-Year Plan period. The State Council urged those involved to make vigorous efforts to promote agricultural development, further perfect modern industries, and optimize regional development strategy in the northeastern provinces. Local governments should also work to ensure sustainable development of resource-rich cities, improve infrastructures, enhance environmental protection, boost employment and affordable housing construction, and deepen reforms of state-owned enterprises while accelerating the growth of the private sector.

The more developed eastern and central provinces should offer better assistance to the development of these regions, the statement said.

3.2 Building a Well-off Society and unbalanced regional realities

Over the past 30 years, China has achieved a "high-speed" average annual growth rate of 9.6%. Although the national economy is moving towards the desired comprehensive well-off stage, among the various regions economic gains are very uneven. In fact the disparities among regions are multi-dimensional, including level of economic development accessibility towards basic public services and state of ecological wealth. Regional development strategy is intended to confront the challenge of *strong ones getting stronger, and weak ones getting weaker constantly*.¹⁹

The following sections will discuss similarities and differences among the four regions based on eight aspects: degree of accomplishing a Well-off Society, level of economic development, urbanization, living standards, regional self-development capacity, basic public services, pollutant emissions, and environmental resources pressure. Despite its relevance, we have not examined environmental resources pressure as a separate point since it is not a subject that permits a brief overview and use of numbers like the other measures.

There are six indicators for measuring the efforts towards accomplishing a Well-off

¹⁹ An Shuwei, Yu Peng, 2009.

Society: economic development, social harmony, quality of life, democracy and rule of law, culture and education, resources and environment. How these are actually measured will not be discussed here, only some results as perceived by the government of China.

Figure 1 shows steady progress in attainment of the Well-off Society goal, but the reality is that only in the Eastern Region is it nearly achieved. The levels of full achievement in 2010 were Eastern Region 88.0%, Northeastern Region, 82.3%, Central Region 77.7%, Western Region was 71.4%. From 2000 to 2010, the highest levels were in the Eastern Region, and the Western Region was the lowest. As cities move towards a 90% level of achievement research indicates a slow-down in meeting the goal. And the indicators do not cover all aspects of what a Well-off Society might be expected to encompass.

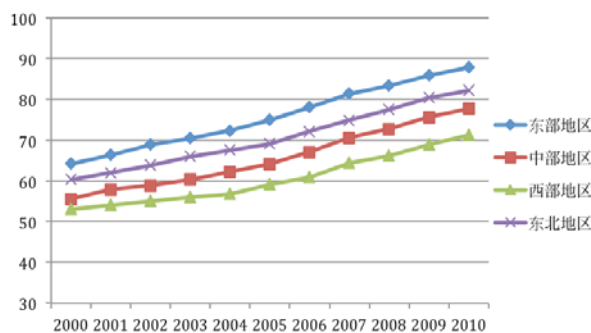


Figure 1. Regional accomplishment in building up a Well-off Society (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeastern region)

3.2.1 Level of economic development and industrial structure

Based on the aggregate GDP, from 1992 to 2010, the Eastern Region ranked first. The GDP of the Eastern Region in 2010 accounted for 57.8% of the national GDP, the Central Region 21.5%, the Western Region 20.3%, and the Northeastern 9.3% of the national GDP. The year 2007 was a turning point in terms of growth rate. Before then, the fastest growing economy was in the Eastern Region; and the Northeast Region had the smallest economic growth in most years. After 2007, the situation reversed; the Northeast Region had the fastest economic growth, and the Eastern Region became the slowest. In 2010, the Central Region experienced the fastest economic growth with a 14.1% GDP growth rate; the Eastern Region had a rate of 12.9%, the slowest. The Western (13.7%) and Northeastern (13.6%) Regions ranked in second and third place. From 1992 to 2010 the Eastern Region achieved much higher GDP per capita than the national average. In 2010, the GDP per capita reached RMB 45,798.2 a level 1.53 times the national GDP per capita. By contrast the proportion of the Western Region's GDP per capita rose from 67% in 1992 to 75.4% of the national average in 2010.

There also are important difference in the industrial structure of the four regions, meaning a range in 2009 from the Eastern Region stepping into the late stage; the Central and Western Regions just entering to the middle stage; while the Northeastern Region was in the late phase of the middle stage of industrialization. Taken together, the national

industrialization level was at the middle stage. These points are important since criticism exists that China has overinvested in heavy industry in recent years. This leads to overcapacity and a search for markets to sell surplus products in China and abroad. And, as the most developed region seeks pollution reduction and energy efficiency, the dirty industries are likely to be moved out, certainly the case in Beijing and Shanghai.

In general there is a major effort to further optimize industrial structure in all four regions. The proportion of the primary industry has declined although the decline in the Northeast has been very small. Among the four regions, the proportion of secondary industry in the Eastern region is steady, and the proportion of tertiary industry (service sector) has increased steadily to the point where some cities such as Beijing now have more than 50% of the economy vested in the tertiary sector, a “post-industrial” situation.

3.2.2 Urbanization

The dramatic shift of China from an agrarian society to one where soon most people will live in cities is unprecedented in scale and vision for the future. Clearly sustainable urbanization must be a priority, and that is a great challenge. With over 600 cities, China faces planning and administrative challenges at an unprecedented scale. It is believed that China’s urbanization process involves migration numbers greater than any other country at any time in history. Cities are the crucible for industrial innovation, and the hub of manufacturing success, but regrettably also the source of much pollution and problems related to land allocation, transportation and many other development issues.

China is on a pathway of urbanization that will see at least 70% of its citizens housed and working in cities. In 2009 the levels of urbanizations in the four regions were: Eastern Region 56.7%, Central Region 42.3%, Western Region 39.4%, and Northeastern Region 56.9%. Increasingly, there are initiatives aimed at improving the models of urban development, for example, through development of Eco-cities, and through designation of some urban areas as Low Carbon cities.²⁰ A substantial number of Chinese cities are rated as highly polluted on WHO lists and by other international agencies. But there has been progress on both environmental planning and specific issues like water pollution.

3.2.3 Living standard – income gaps

Corresponding to the level of economic development, disposable income of urban residents in the Eastern Region is significantly higher than other regions (Figure 2). In 2010, the disposable income per capita of urban residents in the Eastern Region was RMB 23,272; the differences among the Central, Northeastern, and Western regions are very small, RMB 15,962, RMB 15,941, and RMB 15,806, respectively. From 2000 to 2010, the net income per capita for Eastern Region rural residents was much higher than the other three regions, increasing from RMB 3,588 to RMB 8,143. In 2010, the ratio of

²⁰ <http://usatoday30.usatoday.com/news/world/story/2012-07-15/china-building-green-cities/56219286/1> ; see also *Eco-cities A Global Survey. 2011*. This survey, conducted by the University of Westminster International Eco-cities Initiative, indicates that China likely has the largest number of eco-cities found in any country. <http://www.westminster.ac.uk/?a=119909>

urban to rural income was 2.48 in the northeastern region, 2.86:1 for the Eastern Region, and 2.90:1 for the central region. The urban-rural income gap in the western region is relatively high, a ratio as high as 3.58:1 (Figure 3).

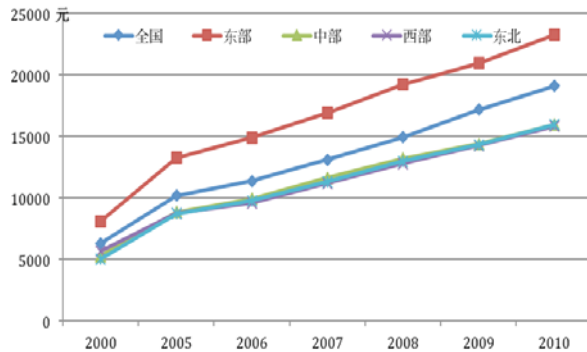


Figure 2. Disposable incomes per capita of urban residents 2000-2010 (blue diamond-national; red square-eastern region; green triangle-central region; purple cross-western region; turquoise cross-northeastern)

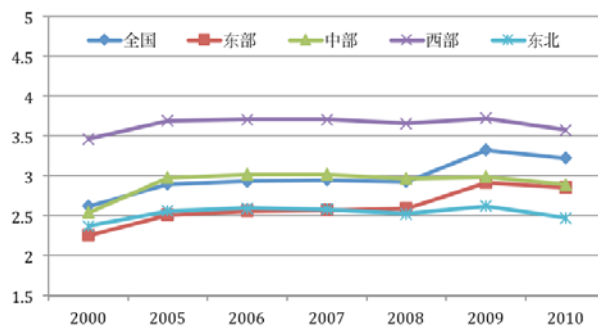


Figure 3. The income gap between urban and rural inhabitants in China's regions (blue diamond-national; red square-eastern region; green triangle-central region; purple cross-western region; turquoise cross-northeastern)

3.2.4 Regional self-development capacity

Capacity to undertake regional development includes the ability to raise revenues locally. Certainly the Eastern Region is best placed to do so (see Figure 4, describing total locally-raised fiscal income levels). The Western Region has shown considerable increase in capacity since about 2007.

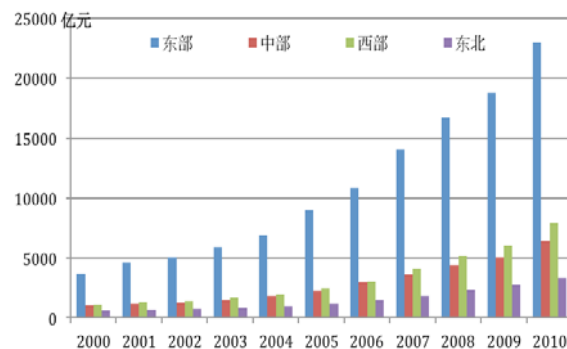


Figure 4. Fiscal income level in billion yuan (based on prices of the years) (blue-Eastern, Red-central, Green-western, Purple-northeastern)

Another useful measure of self-development capacity is the proportion of local fiscal revenue in local fiscal expenditure. This figure is relatively stable over the decade for each region but dramatically different between regions (see Figure 5). In 2010, the percentage ranged from 76.2% in the Eastern Region to 36.8% for the Western region.

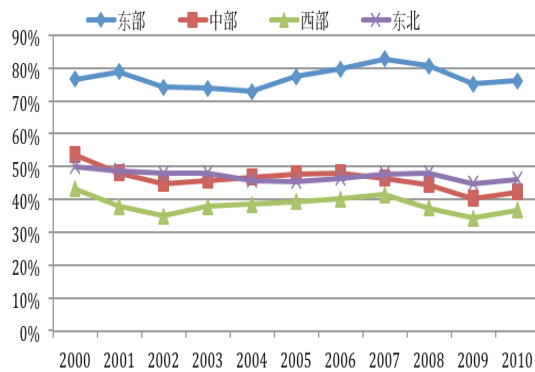


Figure 5. Proportion of local fiscal revenue in local fiscal expenditure (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeast)

3.2.5 Public services

Public services have advanced considerably in all regions over the past two decades, in both urban and rural areas. The rise has been particularly significant in the last decade, including the efforts brought about through post-2008 stimulus expenditure. Here only a few examples are profiled. For example, there are significant difference in the proportion of people with a college degree or higher: in 2009 the figures were 9.02 % for the Eastern Region, 6.1 % for Central Region, 5.6% for Western Region, and 9.07% for the Northeastern Region. In fact, the regional disparities have grown over the period 2005-2009.

For water conservancy, environment and public facilities management industry, from 2003 to 2010, there were significant differences among the four regions in fixed asset investment in such services. After 2007, the Eastern Region's fixed asset investment in water conservancy, environment and public facilities management industry grew significantly faster than the other three regions (as shown in Figure 6).

Both road and railroad mileage increased very dramatically in the past decade, with much of the development in the Western Region (see Figure 7 for road expansion between 2005 and 2010 according to region).

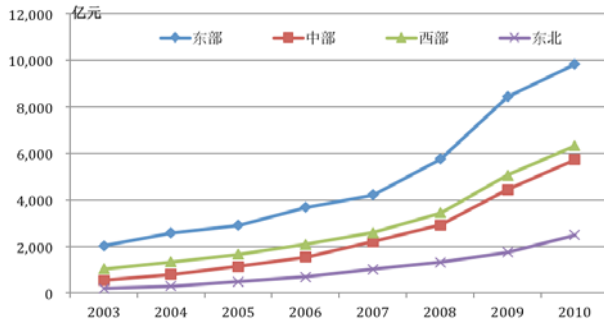


Figure 6. Fixed asset investment in water conservancy, environment and public facilities management industry (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeastern region)

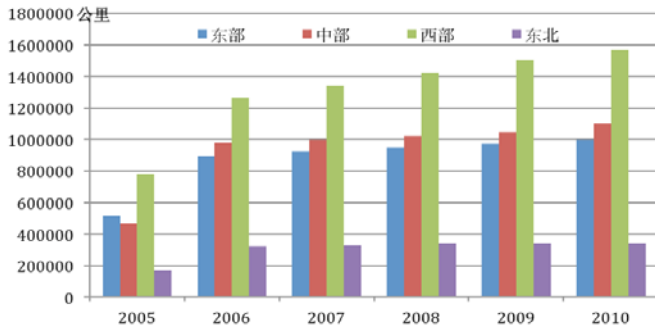


Figure 7. Operating mileage (km) of roads by region (blue-eastern; red-central; green-western; purple-northeastern)

3.2.6 Pollution emissions and environmental emergencies

In 2002-2010, for water pollution the Chemical Oxygen Demand (COD) emissions in tonnes per unit of GDP (billion RMB) showed a declining trend in the four regions. This is, of course, an intensity measure rather than an absolute decline in pollution. The convergence of figures is of interest. Western China started at a much higher level of intensity, and yet was relatively close to the intensity of other regions by the end of the decade (Figure 8).

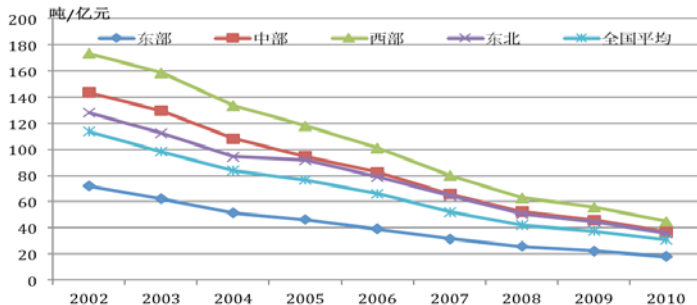


Figure 8. Chemical oxygen demand (COD) mission per unit of GDP (tonnes per billion RMB (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeastern region; turquoise cross-national)

Between 2002 and 2010, the sulphur dioxide emissions per unit of GDP also displayed a declining trend in the four regions (Figure 9).

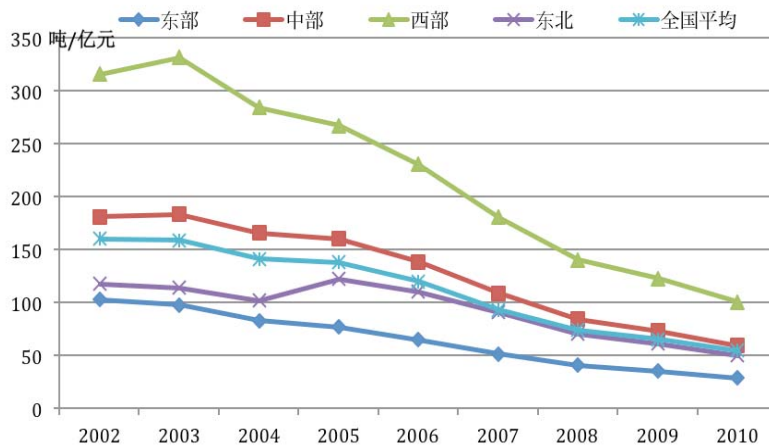


Figure 9. Sulphur dioxide emissions (tonnes) per unit of GDP (RMB) (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeastern region; turquoise cross-national)

From 2002 to 2010, within the four regions, the number of environmental accident emergencies has generally reached a lower level (Figure 10). In the Northeastern Region the numbers have generally been at a lower level, although with some serious incidents. In the Western Region, the number of environmental accidents dropped from 893 in 2002 to 67 in 2010; in the Central Region, the number decreased from 621 in 2002 to 53 in 2009. The situation in the eastern region is very different. Starting in 2008, the number of environmental accidents has again been increasing, from 172 in 2006 to 255 in 2009.

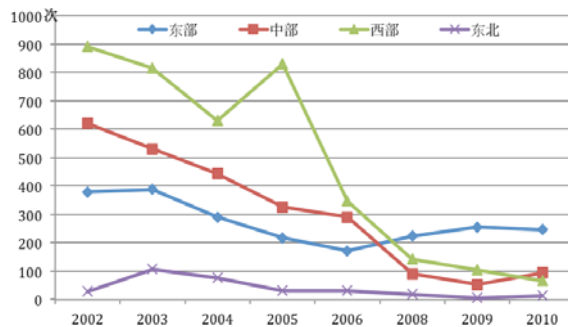


Figure 10. Emergency environmental accidents 2002-2010 (blue diamond-eastern region; red square-central region; green triangle-western region; purple cross-northeastern region; turquoise cross-national)

3.3 Summary observations on unbalanced regional development

There are many hypotheses and conclusions about regional development. However there is not really a consensus on which conclusions are the most important, or even the most credible. Furthermore, the most relevant and appropriate metrics for green and

sustainable development still need to be identified. Nevertheless there are some points that cannot be ignored including those noted below.

3.3.1 Regional performance characteristics

(1) The Eastern Region is at the highest level of economic and perhaps social development, but certainly this has been achieved at a very high environmental cost. Yet there is no full picture of the costs, especially in terms of cumulative impacts, and costs related to health and well-being of ecological services, human health, plus economic productivity reductions.

The economic strength of the Eastern Region continues to lead the country with the aggregate GDP and GDP per capita significantly ahead of other regions; the tertiary service sector is developing rapidly, and drives further optimization of the industrial structure. But in recent years, economic development has slowed down, and the high dependence on foreign trade has led to development influenced strongly by the international situation including global economic volatility. People's living standards in the Eastern Region are in the leading position—the disposable income per capita of urban residents and net income per capita of rural residents rank first among the four regions. In addition, the infrastructure of the Eastern Region is the most complete. However, the level of urbanization lags behind the level of industrialization, and the income gap between urban and rural residents is growing. Migrant workers from other regions, or even from rural areas in the Eastern Region do not have access to full social benefits accorded urban residents.

(2) The Central Region shows many signs of advanced development, but with bottlenecks.

The aggregate economy of the Central Region has continued to increase, and its national proportion shows a rising trend. Living standards improve very fast; the growth rate of net income per capita for rural residents is the highest among the four regions. The construction and development of infrastructure is good. However, the level of urbanization improves slowly, and still lacks coordination with industrialization.

(3) The Western Region has made substantial progress, but still has the lowest level of comprehensive development. There are still major concerns related to the human dimensions, including poverty reduction, income gaps and education; and to ecological fragility, especially at a time of more rapid infrastructure and mineral development, and with pressures from agriculture and grazing on landscapes, Furthermore impacts of climate change and other factors affecting water and ecological services are being experienced. Entry conditions for enterprises are not well worked out. More adequate monitoring and standards are needed.

The economic development of the Western Region has been significantly accelerated, and the overall economic strength has continuously improved, but its overall economic development is still lagging—GDP per capita is at the bottom of the four regions; there is rapid increase in the level of industrialization, but the industrial operational level is low,

and the structure is unreasonable. The growth rate of disposable income per capita of urban residents ranks first in the four regions; the income gap between urban and rural residents is the highest, but the net income per capita of rural residents is lowest.

Infrastructure development needs, low level of basic social services, strong dependence on the central support policies, and weak self-development capacity have seriously restricted the economic and social development of the western region. In addition, COD and sulphur dioxide emission levels of the Western Region ranks highest among the four regions, and ecological damage is very severe. The change of economic development mode is urgent. Furthermore, sustainable development in Western China is a prerequisite for environmentally sustainable development of all China, as downstream impacts from degraded watersheds, polluted airsheds and soils will affect the other regions.

(4) The Northeast Region has a good development foundation, but relatively low growth.

Economic development of the Northeastern Region overall has a relatively strong capability—GDP per capita, and the level of industrialization is right after the Eastern Region. But economic structural changes are difficult; the development of high-end industry and modern service industry is not good enough; upgrading the industrial structure is proving to be a hard task. However the net income per capita of rural residents is only lower than the Eastern Region; the income gap between urban and rural residents is the lowest, and presents a continuously shrinking trend. In addition, the development of education in the Northeastern Region is excellent; the level of urbanization ranks first in the four regions, and human resources are well positioned for economic restructuring, perhaps better than other regions. In recent years, infrastructure development, for example highways, has been slow; urbanization is lagging behind industrialization to a certain extent.

3.3.2 Environmental performance

The environmental performance of the Eastern Region is better than that of the Central and Western regions, especially during the 11th FYP. Whether the total discharge of pollutants, emissions per unit of output value, or the quality of the urban environment, the Eastern Region appears better than the Northeastern, Central and Western regions. Yet, the advent of serious emerging problems in Eastern China, mostly related to development of the last decade may yet change this observation. Marine and coastal concerns such as oil spills and other contaminants, soil pollution and the major air pollution problems such as smog and ozone are pressing matters, with very significant health impacts in some of the richest cities, and with a spread across regional airsheds. Furthermore, the ecological footprint arising from development in the Eastern Region extends far beyond its boundaries as a result of rapidly increasing material demands.

3.3.3 Poverty reduction and income disparities

Although China has made very major gains in dealing with the Millennium Development Goals, the job is not yet complete, and income gaps are growing both within and between

regions. Peng Tengyun and Xu Yong respectively utilized the Gini and GE (generalized entropy index) methods²¹ and concluded that uneven development in China is expanding according to the data from 1995 to 2003. However, this expansion of income has been relatively slow since there has been a general uplifting of economic conditions. Referring to data from 1993 to 2003, Li Qian and other scholars (2006) found that the tendency of uneven regional development expanded after 1993 as measured by per capita GDP, in which the contribution of Central and Eastern Regions exceeds 50%. The research of Jin Xiangyu and Hao Shouyi (2006) shows that after the start of Chinese Economic Reform, especially since 1990, among the 31 provinces and municipalities as well as the Eastern, Central and Western regions in China, uneven regional development is expanding.

The data analysis of the per capita GDP gap coefficient in China shows that this gap coefficient has gone through shrinking (1978-1990), expanding (1990-2004), and then shrinking again (2004-2010) phases, forming a reverse U shape. The analysis of the data in the years of 1978 to 2010, after the Chinese Economic Reform, shows that the Gini coefficient started to fall from 1978 to 1991, and then rose in the years 1991-2003, then fell again in the years of 2004-2010.

3.4 Causes of regional development imbalances

Regional economics as well as national economic development provide explanations for the uneven regional/area development in China. But various other factors significantly affect regional development. These factors include government policies, macroeconomic factors, regional resource endowments, liquidity of elements, and interactions among these factors. No single theory can fully explain unbalanced regional development in China. In pragmatic terms, there are a number of factors that in the past have been important and will continue to be significant as China attempts to narrow development gaps. These include natural endowments and the cumulative effects of six decades of planned development. There are historical origins of the imbalance in regional development mainly manifested in two aspects: available infrastructure, and social capital. Regional social capital will influence the economic efficiency, including efficiency, sense of competition, cultural traditions, and education structure. These points are discussed in more detail below.

3.4.1 Differences in geography and natural resource endowments

Access and transport lead to important transaction cost differences. The improvement of water transportation (especially marine transportation) and land transportation cost-savings, have been advantageous for coastal areas especially for expanding international trade. Inland western regions have significant disadvantages due to inconvenient transportation linkages resulting in high transaction costs.

²¹ For explanation of these terms see Fernando G De Maio. 2007. *Income inequality measures*. J. Epidemiol Community Health. 61(10): 849–852.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2652960/>

Resource development costs tend to be higher in the Western Region by comparison to Eastern Region in particular. Although mineral resources are abundant, those located in distant high mountain areas are difficult to access, extract and process. Costs are therefore high. The natural resources buried in the mountains are difficult to extract, and costs also higher.

Quality of agricultural development varies considerably, with the Eastern Region and parts of some other regions being favorably endowed, and close to high population markets. By contrast, for much of the Western Region's vast lands the quality and potential are lower and subject to environmental risks including climate change impacts, erosion, etc.

3.4.2 Strong correlation between ecologically-fragile and poverty-stricken counties in the Central-Western Region

Within Central and Western regions, of the counties recognized as ecologically sensitive areas, about 76% are also poverty-stricken. For ecologically-sensitive areas, about 43% of such lands lie within poverty-stricken counties. For arable lands classified as ecologically sensitive areas, 68% is located within the poverty-stricken counties, accounting for 74% of the total arable land of the poverty-stricken counties. And, for populations living in areas classified as ecologically sensitive areas, about 74% of such populations live in poverty-stricken counties, accounting for 81% of the total population of these poverty-stricken counties. These figures suggest that the relationship of ecology and poverty in at least some of the poorer areas of China is significant, likely complex, and certainly a significant matter to be considered for sustainable development.

3.4.3 Cumulative effects of development history over 60 years

China's development policy has undergone three stages, including: the stage of focusing on the development of basic agriculture and industry; the stage of implementing the regional gradient development strategies and eventually prioritizing regional development of the Eastern Coastal Region with an emphasis on *Opening Up*, accompanied by economic and some financial and political reforms; and the stage of implementing balanced development strategy, including the Western Region Strategy.

The economically well-developed regions obviously have benefitted greatly from preferential policies of the national government.. The disparities of the *Opening Up* period led to a more open economic environment in some cities while others remained closed to outside investment. Prioritizing the coastal economic system reform created crucial differences in regional development. From a practical point of view, areas with the *Opening Up* pilot project experience got rid of the rigid planning system first, stimulated their economic vitality, and realized the rapid development of the private economy. In addition, geographic advantages could be optimized, such as access to cheap shipping from coastal ports.

3.4.4 National development strategies and plans during different periods

From 1949 to 1972, the government's strategy was even development; during this period of time, the priority was given to the development of the backward inland areas. By setting up heavy and chemical industries in the inland areas, this strategy was trying to change the previous eastern-oriented layout for heavy and chemical industries. The Central and Western regions invested in low value-added mining and energy industry, whereas the East Sea coastal area was focusing on processing industry. Therefore, with regard to industrial structure, the Central and Western regions were in a disadvantaged position. From 1973 to 1978, China's development strategy gave priority to the development of coastal areas.

During the 6th FYP (1981 to 1985), the government emphasized setting up regional development strategies based on regional comparative advantages. At this stage, the development strategy was gradient development from coastal to inland. The coastal areas had the priority to optimize the industrial structure, build up infrastructure, and participate in international trade and investment. Inland areas needed to develop energy, transportation and raw materials industries to support coastal areas. The special economic zones and opening-up policies were implemented, mainly along the south coast, especially the Pearl River Delta, and including Zhuhai, Shantou, Xiamen, and Hainan special economic zones plus 14 opening cities. Overall, the eastern coastal areas gained greater autonomy in finance, taxation, prices, investment, credit policy, and the eastern coastal areas have relatively greater institutional innovation space.

From 1991 to 2000 (8th and 9th FYPs) the development strategy aimed to coordinate development of regional economies and reduce regional disparities. It adopted a series of policies to stimulate the development of inland areas, including increasing the funds for the infrastructure construction of the inland areas, attracting foreign investment for the inland areas, and guiding the collaboration between inland and coastal areas. The Special Economic Zones began to expand from the southern coast (southern section) to the central coast and the northern coast, forming the Yangtze River Delta-centred "middle section" and the Bohai Bay-centred "northern section". Meanwhile, the regional development focus moved from the eastern coast to the central and western regions, especially from the east to the west along the Yangtze River Valley.

Starting with the 1999 Western Development Strategy, the government tried to implement balanced and coordinated development. The Western Development Strategy focused on attracting foreign investment through improving the basic infrastructure and business environment, with the hope that the Western Region could catch up with the development in the Eastern Region. However, based on actual results, the regional disparities between the eastern and western region were not significantly lessened. In addition, the government promoted the "Revitalization of the Northeast Industrial and Other Old Industrial Bases" strategy (2004), "the Rise of Central Region" Strategy (2006) and other policies, such as to increase transfer payments. Now, in the 12th FYP, the government aims to reduce regional disparities and seek coordinated regional development.

3.4.5 Regional industrial structure

The industrial technical content, added value, and economic scale of different regions are different, leading to differences in how fast industries can change and advance. In the Western Region, the main industry has been primary industrial raw materials processing. In the development of a heavy industry strategy in the Central and Western regions, many large and medium-sized state-owned enterprises have been established; most belong to low value-added extractive industry and energy industry, and raw material industry with low processing depth and level. These industries are hard to integrate into local rural industrial structure and further promote the development and growth of the rural township enterprises. After the Chinese Economic Reform, the Eastern Region gave priority to the development of high value-added industry including finance, trade, information, and communication. The Western Region became a periphery zone of agricultural and other primary products, resulting in the expansion of inter-regional disparities for more than 20 years. Qin Chenglin's (2011) analysis shows that primary industry has made a great contribution to resolving the issue of regional development imbalances in China. Contributions of other industries including service industry, the wholesale and retail industry, hospitality industry, and the financial industry to the uneven regional development in China ranked at the second, third, and fourth place respectively.

3.4.6 Regional marketization and ownership

At the moment, the marketization level of the Eastern Coastal Region is relatively high; collective, private, foreign and other non-state-owned economy have all made relatively large contributions. The situation in the Western Region is the opposite. Wang Feng (2007) found that regional differences in human capital, the development of a non-state-owned economy, and the extent of opening to the outside world are important causes of the imbalance of regional economic development in the present stage. Wang Xiaolu and Fan Gang (2004) pointed out that the economic growth gap between the Central-Western regions and the Eastern region is mainly due to the low productivity. This issue depends mainly on the regional difference of technological progress and marketization. In terms of marketization, the disparity between the eastern and western regions is very significant, particularly, the regional disparities on the non-state economic development and factor market development (capital, labour, land).

Regional restrictions have existed for a long time in the capital market and the labor market in China. Specifically, the inter-regional free flow of labor cannot be achieved; imbalance exists in regional investment. These factors are an important cause of the differences between the coastal and inland areas. In addition, technical workers prefer to find higher-paying job in the coastal areas. Also, there are differences between the coastal and inland areas on the growth of investment, financing structure, and the efficiency of funds allocation. These factors can amplify regional differences. Furthermore, the imbalances in regional development cause labour migration to the well-developed regions, and therefore intensify the regional differences.

3.4.7 Central fiscal policy

At present, the central government promotes regional coordinated development through fiscal transfer payments and by improving public services. To accomplish fiscal transfers payment, the government changed the previous decentralized fiscal tax system to the current tax sharing fiscal tax system. As a result of the reform, the central fiscal income has accounted for a big proportion of total fiscal revenue and changed the former situation of local fiscal domination for some areas. As the central government has gained more revenue, it can provide more subsidies for the less developed regions. The design of central government's fiscal policy design is not based on local economic development and sources of revenue growth, but on the average of recent years' fiscal revenue and expenditure. Regions like Eastern China with larger fiscal expenditures and higher potential for economic growth benefit by gaining more income.

3.4.8 Chinese Economic Reform policy (globalization and economic liberalization)

Globalization and economic liberalization amplify the regional disparities. Through export and foreign investment, globalization promotes economic growth; adopting advanced technology promotes economic growth and competition among enterprises. The Economic liberalization promotes economic growth by optimizing the resources allocation. However, at the same time, owing to the regional difference in resource endowments, economic structure, and policy, globalization and liberalization may broaden regional disparities.

Chinese Economic Reform policy implemented policies preferential to the eastern coastal regions, including low tax rate, high financial return, and permission to use land for high-tech industrial development. This situation benefits the eastern region in many ways, for example, through better utilization of foreign capital for economic development, accumulating capital from international trade, introducing advanced technology, and adopting good management experience. Over the past 20 years of economic reform, market-oriented foreign direct investment and private investment drove the large amount of capital flows to the Eastern Region with accelerated economic growth results, but also expanding regional disparities. Commercialization of scientific and technical achievements in the Central and Western Regions is still very low. The resulting disparities in human capital between the Eastern and the Central-Western regions have become an important factor in regional differences.

3.4.9 Role of policy interventions

In the 8th FYP, China began to focus on more even regional development, and proposed coordinated regional development strategy: *to handle and perform regional advantages and the national coordination of planning, and the relationship between the coastal and inland areas, the economically developed regions and less developed regions, motivating the regional economy to move towards reasonable division of labor, performing advantages, advantages of complementarity, and coordinated development direction.*

This strategic thinking was further explained and specific measures identified during the 3rd Plenary Session of the 16th Central Committee of the CPC as the *Five Overall Arrangements*. Strategies like the development of the Western Region, the rise of the Central Region, and the revitalization of the old industrial bases in the Northeastern Region aim to narrow the regional development gap and to promote more even regional development and targeted measures.

The specific contents of the *Five Overall Arrangements* are to:

actively promote the development of the Western Region, revitalize of the old industrial bases in the Northeastern Region and other regions, promote the rise of the Central Region, and encouraged prioritization in Eastern Region development; continue to highlight advantages of the various regions and enthusiasm, improve the market mechanism, cooperation mechanism, mutual aid mechanisms, support mechanisms, and gradually reverse the trend of the regional development gap, forming the new pattern of the western and central regions to promote each other, to take advantage of complementarities, and to promote common development goals.

The 16th Plenary Session of the Fifth CPC Central Committee passed *the suggestion of the 11th FYP from CPC on the national economy development and social development*. This *suggestion* promotes the healthy development of urbanization, adherence to coordinated development of medium and small cities and small towns, improvement of the overall carrying capacity of cities and towns; continue to upgrade the driver and radiation effects of the Pearl River Delta, Yangtze River Delta, and the Bohai Sea region on the mainland's economic development; and continue the role of special economic zones and the Pudong New District of Shanghai, while stimulating the economic development of Tianjin Binhai New Area, and other areas with advantageous conditions.

The Decision of the Central Committee of the Communist Party of China on Several Important Issues on Building up the Socialist Harmonious Society passed by the 6th Plenum of the 16th CPC Central Committee, mentioned:

implementing the overall strategy for regional development and promoting coordinated regional development to form a regional industrial structure with reasonable division of labor, obvious characteristics, and complementary advantages, and to promote the common development of all regions; increase support to less developed areas and difficult areas, improve the infrastructure and the education, health, cultural and other public service facilities of the central and western regions, and gradually narrow down the gap among the regional basic public services; improve the support for the old revolutionary base areas, ethnic minority areas, border areas and poverty-stricken areas as well as major grain producing areas, mineral resources development areas, areas with ecological protection challenges, and ethnic groups with small population; support the economically developed areas to accelerate industrial structure optimization and industrial transfer, support the advantageous industrial projects in the Central and Western regions to speed up the transformation from resource advantages into economic advantages, encourage the Eastern region to help the development of the Central and Western regions, expand the developed areas to provide related assistance to the less developed areas and ethnic minority areas, form the mutual benefit mechanism with government as the leader, market as the channel, enterprises as the mainstay, the project as the carrier, establish a system for resource exploration with the pay to use and compensation mechanisms, put up measures to

support the implementation of regional economic transformation in areas confronting resources recession and depletion.

Corresponding to the above policies, the government controls and regulates the developmental spaces through planning, policy, investment, and other measures.

Measures aiming to balance and correct regional development disparities include:

- *Improving management of land resources.* This is the measure that most governments try to implement. China has strengthened the planning and management of land, including 18 million acres of arable land with red line protection.
- *Developing better regional policy.* For example, when implementing the development of the Western Region, carrying out the Northeastern Region revitalization, and promoting the development of poverty-stricken areas the government carries out a series of preferential policies to support the region to accelerate development.
- *Improving overall planning.* The central government already has prepared some 86 regional planning or guidance documents. The major contribution of those efforts is to provide functional orientation for regional development, and clarify the role for each area in the national socio-economic development. Better coordination of plan implementation, attention to overlaps that create clashes between objectives, and other efforts towards integrated planning and management must become key priorities.
- *Promote infrastructure construction and implement of major land improvement projects.* Construction of the Qinghai-Tibet Railway and much other highway length and other infrastructure is intended to improve the conditions for regional development.

In 2006, the national 11th FYP put forward promotion of the regional main functional areas. Regional main functional area planning is based on: the region's resources and environmental carrying capacity, existing development density and development potential, consideration of the future of China's population distribution, economic layout, land use, and urbanization patterns, and division of the land space into classes based on development potential and protection needs. Areas suitable for future large-scale accumulation of population and industries would become the development class areas, and ecologically sensitive areas would be the protected class area. Within these general categories, according to the degree of capacity and sensitivity, areas will be further divided into four main functional areas: optimized development, key development, limited development, and prohibited development areas. Different regions have different functional orientation and assessment index systems (Zhang Xiaorui and Zong Yaoguang, 2010). The regional main functional area planning helps to go beyond ecologically insensitive administrative divisions, with the hope that better coordinated allocation of resources can achieve balanced social, economic and environmental development. However, the planning of the regional main functional areas is still at the elementary stage operating at a scale sometimes too coarse for use in local planning.

3.4.10 Multiple factors at play

Uneven regional development in China is the outcome of many factors. First, the economic geography, history, and a variety of factors lead to the situation that the level of

economic development of coastal areas is higher than the inland areas. This is an early gap effect, that is, during the early stage of development, the gap of income per capita or starting points has a major role in enlarging the disparity at a certain stage. There can be cumulative effects. Second, the national gradient development strategy and tilt policy accelerate the trend of enlarging the economic disparity between coastal area and inland area due to the benefit gained from participating in the globalization and liberalization of the economy. Third, among different regions in China, the investment model is very different. The investment in human capital in developed coastal area is significantly higher than the central and western inland regions. The return on investment in human capital, social capital, and intangible capital is higher than the return on investment in the development of natural resources, physical capital, and tangible capital.

4 SOME KEY ISSUES

4.1 China's environmental still faces serious challenges despite vigorous mitigation efforts.

The pressures on environment continue to rise as a consequence of China's rapid development even though there have been important advances in pollution control and other environmental planning and management efforts especially in the 11th and 12th FYPs. Current efforts will help, especially transformative changes in the economy related to industrial restructuring and improved regulation and market-based incentives. There have been enhanced efforts to address the most difficult pollution problems such as non-point agricultural pollution sources, and photochemical smog. However, there remain institutional cooperation and coordination issues, implementation inefficiencies, and great difficulties in the conduct of integrated environmental planning and management. These systemic issues will continue to hold back progress unless they can be tackled effectively.

Overall there is a need for accelerated efforts to tackle significant challenges in the environment and economy relationship of China, especially in the implementation of Circular Economy, Low Carbon Economy, and Green Economy. The continuing decline of ambient conditions needs to be stopped during the 12th and 13th FYP periods, so that environmental protection guarantees can be well implemented during the decade after. Then China can truly meet its expectations for an Ecological Civilization and Ecological Progress. By 2030 to 2035, the main environment and development problems of today should be solved, or well on the way to solution. The tasks are massive for this to happen well.

The sobering thought is that new issues will continue to emerge, especially as China's domestic consumption expands, and as Climate Change impacts are expressed throughout the country. China is already encountering various limits and scarcities created by a variety of factors, including push-back from citizens concerned about development, from high food, energy and many other demands on natural resources, and, internationally from matters related to trade and investment and from the increasing demands linked to

regional and global environment matters. Expectations are high on the part of China's citizens and from the global community that China will play a growing role on green development internationally, including transfer of its best experiences into other developing countries.

There are also emerging opportunities associated with the transformative changes required in environment, economy and development relationships. Green development and sustainable development will produce new streams of revenue as well as jobs and better quality of life. Turning these hopes into reality will require that the current efforts to mainstream environment into economic and social decision-making must be considerably strengthened—at the national level, and within all regions of China.

As CCICED's 2012 study reports indicate, whether a region in China is economically advanced, even becoming post-industrial; or whether at an earlier stage, such as Western China, there are both significant challenges and opportunities for environment and development. Another reality check is that it will take insight and effort on the part of those cooperating with China internationally to keep a steady and productive relationship that optimizes outcomes for all sides. Otherwise, it is possible that the shift to green economy and development could stall. That would be most unfortunate whether the impacts are in China or in other countries.

4.2 Today's regional development strategy does not guarantee sustainable development within or among regions.

Certainly over the past 15 to 20 years there has been a shift towards a more comprehensive approach to regional development policy and planning. The four main regions have benefitted differentially, yet all have experienced trade-offs between environmental quality and economic growth, and with different levels of natural, human and social capital as a result. The richer areas of Eastern China have experienced significant declines in air and water quality, but now have the management capacity, including well-trained people, technical and financial resources, to deal with these and even the most difficult environmental protection problems in the coming years. Other areas, especially in Central and Western Regions, are not as well equipped to deal with the environmental stresses associated with high growth rates. Some areas are experiencing the double-digit economic growth rates common until recently in Eastern China provinces. However these other regions face the possibility of pollution spreading and intensifying from inward migration of heavy industry; impacts of mineral resource development; and the effects of rising market demand for animal protein on grasslands and water quality.

Regional growth places emphasis on transportation and infrastructure development. Some decisions are on track in relation to efficiency of energy use as well as opening opportunities for implementing renewable energy, for addressing poverty, and for ensuring that basic environmental infrastructure (water and sewage, solid waste disposal, protection against natural hazards) is in place throughout China. All these investments often have major environmental impacts, for example, from dams, and water diversion projects, and the effects of highways and pipelines on ecosystems and biodiversity.

Indeed, new corridors transform landscapes on a massive scale. The cumulative environmental impacts of transportation and infrastructure are only beginning to be well understood in some of the larger parts of the country, especially in Western, and inter-regional effects.

Although China has experimented extensively with water basin planning and management, marine and coastal planning, and, more recently, with regional strategies for air pollution, these efforts have not met with necessary levels of success. Often there are collisions of objectives among sub-regions, or between regions. Mechanisms such as eco-compensation for protection of ecological services have taken hold. However no national system is in place. Some problems such as smog have become regional issues where no single city or industrial area can control the problem, since airsheds are polluted from multiple sources over extensive areas. This same problem exists for non-point agricultural pollution, and of course, marine areas.

Unless regional development strategy places greater emphasis on green development throughout all parts of China, and on inter-regional issues, it will be difficult to achieve sustainable development either regionally or nationally. The regions are so interlocked that even if there are improvements in part of the country, these achievements will be endangered if conditions decline elsewhere. This has already occurred in relation to air and water quality, and possibly in soil pollution problems. The difficulty to be faced is how to fairly and effectively address needs for differentiated approaches while still ensuring that the nation as a whole benefits.

4.3 Mechanisms for differentiated regional green development are still at an elementary stage.

It is appropriate for the goals of green development to vary between regions; and, within each of the four major regions to vary among the different provinces, autonomous regions and municipalities. This point is often explicitly recognized, for example by setting out differences in the environmental targets to be reached, and in relation to actions such as outmigration from areas that need strict ecological protection, or in the funding allocated to reforestation or grassland programs for protecting ecological services. The best efforts deserve considerable praise as successful efforts to accomplish both environmental and social economic development objectives. However, there is considerable confusion, sometimes with objectives working at cross-purposes and lack of capacity and understanding for newly introduced management concepts.

Confusion exists over national vs. regional pollution standards and practices. Although it is not surprising that differing levels of pollution control are a reality in China today, there must be some agreement about the future. The issue is whether major pollution emitting centres should be treated more or less alike, and cleaned up to similar standards and over similar time periods. Or should there be more lax standards in areas of lower population, or at an earlier stage of development?

Western China development is being based in part on policies related to Eastern China's past experience and primarily based on stimulating economic growth through increased

investment. This strategy, which can rapidly raise growth rates to levels above 10 to 12%, led to high energy and high pollution outcomes and the same could happen in Western China and perhaps in other areas: ‘pollute first, clean-up later’. Certainly there is some hope that the worst will be prevented, but the capacity to deal with rapid development is limited, and there is limited control in dealing with the large number of industrial shifts taking place.

Incentives for environmental improvement are inadequate in the taxation system and in regulatory measures such as fines for pollution control. Enterprises have limited incentive to spend on environmental controls as long as there limited financial sanctions, or if they are not encouraged through sharing of costs for improvements. Competition between regions and provinces to secure industrial development is severe and cutting environmental corners by accepting less than best practices in order to secure industry growth is an issue. Green tax reform has been slow.

R&D investment in green technologies and capacity building of innovation skills is limited in some areas. If the right combination of human resources and access to green technology cannot be put in place, there is limited potential for green development. This places some sub-regions at a severe disadvantage, as cities and resource-dependent communities in rural China have discovered.

Main functional zoning is not developed well enough to be a reliable tool for sustainable and green development. China’s laudable effort to define zones according to sustainable land and water use based on ecological conditions, existing uses and special conditions has been underway for a half decade. Yet main functional zoning is by no means a success at this point. The scale is too coarse (i.e., not operative at very local levels), and the designations are poorly understood locally. The functional zones and their boundaries are defined without full participation of affected people and resource users. They may become locally contentious. Thus what could be a most useful means to resolve land and water user conflicts and marine resource overlaps must be considerably upgraded to achieve optimal results. This will take a decade or more based on experience in other countries, and it is urgent to accelerate progress.

There is no comprehensive, unified eco-compensation system in China, although substantial financial support is expended each year on such compensation. China has a well-established and quite extensive set of initiatives to provide longer-term protection for watersheds, wetlands, and other areas that provide ecological services. Most of the payments originate from central government, or upstream subnational jurisdictions. Those benefitting most from the services (e.g., cities on rivers downstream) generally pay little. Furthermore, at this point, there is limited assessment of how to achieve best value for expenditure. Eco-compensation is a vital part of both national and regional green development strategies and likely could produce much greater benefits at lower cost, with more consideration of having beneficiary regions directly share in the costs. Better outcomes might then occur more quickly.

4.4 Industrializing and post-industrialization processes require separate but linked green development approaches.

China is currently paying much attention to structural adjustment of its heavy industry in order to reduce the extent of overinvestment and environmental damage, and to provide a quicker path to more balanced growth, including expansion of the service sector. As the service sector's contribution rises to levels of 50% or greater, there should be positive effects on environmental conditions in the Eastern Region. The assumption would seem reasonable, but the balance is precarious since there is redistribution of heavy industry especially to Central and Western Regions.

Green development for industry must be multi-pronged, taking into account cleaner production based on lower pollution intensity, ultra-energy efficient and non-polluting new production processes, and substitution of processes and products. Such industrial ecology is becoming well tested in China, but still not widely enough applied. Consolidation into large, modern operations combined with forced closure of inefficient producers occurs frequently and this trend will continue.

Soon industrialization will see quite separate types of situations. One is in the newly industrializing locations such as Western China and parts of Central China, where there may be good intentions but limited capacities to move directly to a desired high level of clean production and advanced technologies. The second is the post-industrialization situation in areas such as the Northeast and East, but also in the other regions, where dirty industries have moved out, leaving a legacy of brownfields that require expensive remediation. The post-industrialization areas also face the emergence of new service-oriented facilities and activities that have their own new types of environmental problems such as the high energy use of major computer data storage facilities, the demands on the financial sector for improved environmental monitoring of their loans and other activities, and the tourism sector with its impacts on biodiversity and fragile ecosystems. Thus separate but linked pathways of green development are needed to make regional green development supportive of national needs.

For greening of older industrialized areas that remain in place, entrance requirements need to be high so that best practices are favored. It will be necessary to have high standards put in place throughout China—so that simply dismantling old high polluting, high energy use industrial plants and re-assembling them in new locations is not an option. Mechanisms are needed for sharing experience based on success stories where production facilities have been environmentally upgraded cost-effectively. Much of this successful experience can be gleaned from locations in the Eastern Region.

For some of the service industries that increasingly will be found throughout China, there are challenges that include green building design, design and operation of new business campuses, and light industry or high-tech green industrial parks, and the development of green relationships, whether for investments, market supply chains, or customer/client oriented certification or other programs that demonstrate commitment to green development and green products.

At the heart of all these approaches is corporate social responsibility, covering the industry's license to operate in a community and its profitability based on meeting—in a transparent way—specific environment and green development goals.

4.5 Green development coordination and integrated management is limited in effectiveness.

Coordination mechanisms are insufficient at local-provincial, regional and within central government levels. This is a general problem concerning development within China, but it is perhaps more severe in the case of environment and green development concerns. The reason why is that many such concerns are “spill-over” problems, or externalities. In addition, most of China's rich resource bases are now being exploited in a single-minded way to meet very specific objectives that demand a more or less constant increase in production. The Bohai Sea is an example in the marine environment, where more is being demanded from fisheries, aquaculture, offshore oil and gas, tourism, and from shoreline development that includes extensive infill and loss of wetlands. There is no effective integrated planning and management; nor is there a robust emergency response system. Thus when an oil spill occurs, the economic cost is high and ecological damage excessive. Similarly, the pollution over China's cities now requires an integrated management approach since the primary pollutants from various sources and locations form into secondary pollutants such as PM_{2.5} small particles that spread widely and form a costly regional problem that is hard to solve.

The success of past efforts for environmental protection has been based largely on meeting defined single targets, whether for reforestation (% of forest cover) or pollution reduction and energy efficiency (reduction of SO₂, energy intensity reduction). The problem is that these targets do not necessarily translate directly into improvements in ambient environmental conditions, or to more healthy ecosystems, or even to reduced environmental risks. This a dilemma that will be repeatedly encountered in the complex situation of regional green development in China, where there already exists a high level of demand on the part of citizens for actual environmental improvements. The argument for effective integrated assessment and management includes improved capacity for monitoring for improvements in environmental quality progress, plus human and ecosystem health. The recently-created MEP regional offices have demonstrated the value of independent monitoring, and should be strengthened in order to carry out their mission even more effectively.

Given that existing regulation and institutional arrangements are not working to solve these and other such problems such as integrated water basin management, there clearly must be a move to new ones. There are numerous models to draw on from international experience, for example Los Angeles on air pollution, Murray Darling river basin management in Australia, the Barents Sea integrated management and the Black Sea Commission in Europe. China may learn from these and other approaches, but it will need to define approaches unique for its own complex situation. Two great problems need to be addressed: (1) overlapping institutional responsibilities without clear lines of authority; and (2) limited monitoring and enforcement abilities, with many dispute resolution needs.

More broadly, there is no clearly defined green development authority at any level of government in China; nor is there a full understanding of how far-reaching an integrated planning and management approach to green development might have to become. Green development certainly requires new investment strategies, new indicators of progress, improved sharing of information, regulatory streamlining, clearer lines of accountability, and capacity development. It may be valuable to consider consolidation of implementation authority so that resource and environmental management may be dealt with on a more holistic basis, and in the context of regional green development.

4.6 Lack of a clear long-term vision and strategy to guide national and regional action for green development in China.

The 1994 China Agenda 21 document provided a comprehensive sustainable development outline appropriate for China's needs at that time. It was to a considerable extent outstripped by the high economic growth rates of the past 15 years, leading to the situation of today's "unbalanced, uncoordinated and unsustainable development." While many of China's existing policies are suitable for a national green development strategy, they are still pieces that do not add up to a whole, and there is no nationally-adopted strategy. A vision and strategy at least to 2030 are needed, and for some important elements such as Low Carbon Economy, the need extends well beyond that time frame. A strategy for Green Development needs to consider the optimal balance and utilization of natural, economic, social and human capitals to bring about and sustain green regional development and prosperity. In addition there must be political leadership and good governance at a national level without which any strategy is likely to fail. The timing for defining and adopting a Green Development Strategy is excellent, given that, at the 18th CPC Congress in November 2012, Ecological Civilization/Progress was elevated to the same level as Politics, Economy, Society and Culture—all main drivers of change for the whole Chinese society.

Citizens should play a responsible & helpful role in green development planning and implementation, yet the opportunities to do so are largely beyond their reach at present. Four examples of how this situation could be improved include:

- Expanding opportunities for more substantive direct citizen input to environmental assessments and other planning processes; with government providing full disclosure on green development concerns including topics such as toxic waste inventory and disclosure, and regular monitoring of environmental problems.
- Fostering green job opportunities within regions, e.g., to support low carbon economy, circular economy, etc. This may require financial inputs through mechanisms such as eco-compensation.
- Putting in place co-management arrangements with local community groups in Western China & elsewhere for ecological construction and nature protection including ecosystem and biodiversity conservation.
- Placing greater emphasis on environmental education, community improvement initiatives and other means to promote an understanding and capacity for green development.

Green consumption should be part of the Green Development vision and strategy. This element should be tied to both consumers and producers. If green choices are unavailable, poorly understood, not offered at a reasonable price point, or uncompetitive for other reasons they will not be purchased. Both goods and services are of concern, especially regarding personal transportation, government procurement, and in market supply chains. It is observed that a significant number of urban dwellers in China are moving towards western consumption levels either at home or in their office workplaces, often in western-styled high energy consuming buildings. While a small number of office buildings in China are built to LEED standards, most are not.

China's cities are essential partners for Green Development and yet in the rush to build quickly and cheaply this potential is not being fully exploited. There is no overall Green Development Strategy for China's urban development, although there are many interesting initiatives unfolding. The concept of eco-cities, pioneered in other countries but also found in China is one starting point. Another is the enthusiastic reception of many Chinese cities to Low Carbon Economy, as highlighted at the Shanghai Expo.

China's urban development allows for a variety of approaches to take into account the uniqueness of setting, cultural, stage of development, and other characteristics. Also, there is the opportunity to build specific innovations centred around sustainable technologies, for example related to green automobile development and production, and a focus on high quality of urban living through outstanding urban planning and design. Gateway cities to areas of outstanding natural beauty can develop a tourist based service economy. It is quite likely that within the various regions of China, it is the cities that will take the lead in defining green development opportunities and pathways.

4.7 Alignment of China's Green Development with International Green Economy Trends.

Rio+20 emphasized Green Economy directions at the national level, but was not particularly strong on sub-national regional development needs. Generally, China is ahead of many other countries in terms of exploring the implications of green growth, economy and development. However it is essential for China to draw upon the relatively rich experience in other parts of the world that could hasten China's own transformative changes. Secondly, China already is in a position to market both goods and services for green development to other countries and thus turn its efforts into substantial economic gains. Third, there are important implications for China's future international cooperation, especially with transferring experience and technologies to developing countries, and in cooperation with countries to solve problems of mutual interest such as clean energy technologies. There is a need to green China's Outward Direct Investment (ODI) and perhaps include this process in the overall Green Development Vision and Strategy.

Finally, given that Green Economy and Green Growth will be an important component of discussions in future international negotiations and dialogue, China can seek workable partnerships and other cooperation that will benefit its own regional and national development, and will contribute to better development elsewhere and globally.

5 CONCLUSIONS

Consolidation of environmental protection and management, low carbon economy, circular economy and sustainable development strategies with green growth and green economy is needed in order to provide a strategic direction for green development. In a few words: mainstreaming green development into national and regional decision-making. China's most recent elevation of *Ecological Progress* places the subject at the highest level of societal drivers. This should permit accelerated consideration of green development in future regional development efforts well into the future, especially in the critical period between now and 2030. While the CCICED studies this year provide insight into green development roadmaps for specific regions and types of problems, it is very evident that a national green development strategy strongly focused on regional development and also on China's external environment and development relationships is needed for guidance. Such a strategy would be very helpful in providing substance and practical guidance for implementing a comprehensive approach for *Ecological Progress*.

5.1 Mainstreaming regional Green Development

China has made substantial commitment in the 12th FYP to addressing regional economic imbalances and to enhancing environmental quality throughout China. These commitments will provide a substantially altered baseline condition by the start of the 13th FYP. The richer provinces will focus on pollution reduction, but it is very important that new sources of environmental degradation not be allowed to gain a foothold anywhere, as happened with nitrogen pollutants during the 11th FYP. Migration of heavy industry is already taking place on a considerable scale, but should not be at expense of the environment, for example in Western China. Significant issues of inter-regional cooperation & competition, transfer payments, eco-compensation. Urbanization is a key matter for regionally balanced development, including regional clusters of very advanced infrastructure development and with great possibilities for mainstreaming green development. As well, rural-urban migration is one of the most significant subjects with regard to inter-regional development management, and will play an on-role on green development.

The following conclusions are useful considerations for the mainstreaming of green development:

- All regions are interdependent with regard to environmental changes and impacts, but the actual issues and the capacity of regions to deal with them are quite different and depend on many factors. Thus, while high quality of environment should be maintained throughout the nation, and the necessary standards put in place to ensure this happens, differentiated strategies are needed at regional and sub-regional levels.
- Continuous attention and guidance is needed from senior leaders at all levels to ensure that better coordination produces optimal outcomes. This coordination should be both vertical and horizontal, and between sectors. Green development requires

institutional changes and considerable attention to capacity development. There is a need to improve accountability and to monitor outcomes through improved ecological knowledge and environmental quality. Green development requires good governance in order to achieve cost-effective, high quality outcomes.

- Green development has to be a longer-term planning effort with an agenda that extends until at least 2030, and increasingly demanding objectives including those of the current 12th FYP and the 13th FYP. Over time it should be possible to build more integrated green development approaches for topics such as poverty elimination and protection of ecologically fragile areas, green urban development, and rural ecological progress.
- Major investment decisions are required on the part of both government and enterprises to ensure effective and efficient use of funds for environmental protection and for the emerging low carbon economy. Many of these decisions involve SOEs, and also municipal levels of government. There has been much concern on how the concept of scientific development can best be applied for these decisions and in the follow-up management actions. Further improvements of environmental impact assessment, new efforts such as social risk management, and environmental audits are being discussed at present. These are promising mechanisms, but require careful consideration of how they can produce better results without further administrative confusion and coordination complexity. They also require a high level of transparency in their application.
- Laws and regulations pertaining to greening of regional development, and necessary incentive systems require further attention. Some environmental laws are outdated, and perhaps are not sufficiently robust to address emerging problems such as regional air pollution, adequate fines or other punishment for major incidents, or health and environment risks. Promotion of the rule of law includes the need for improved disclosure of environment and development information. It also means full access to courts for citizen complaints and other mechanisms that improve the capacity of citizens to monitor, comment upon, and take action for the safeguarding of their local environment, and participating in the improvement of the country's *Ecological Progress*.
- China's efforts for mainstreaming green development may be helped by improved linkages to green growth & green economy efforts elsewhere in the world, including both developing & industrialized countries

5.2 Practical priorities for Green Development

Among the many practical priorities that have been identified in the discussion on regional green development, seven stand out for special attention in all regions:

- Improved human capital in all regions through robust employment strategies, with a focus on poverty reduction, education, health, and advanced skills for value-added employment especially in the service sector.

- Improvement of the integrity of urban and rural environments and ecosystems and biodiversity management, improvement of ecological services, high quality of the built environment, regional pollution control, sustainable resource use.
- Transition to a Low Carbon Economy including sustainable energy transportation & infrastructure, application of green technologies throughout energy production and utilization in key sectors, and major shifts away from today's approach to coal use.
- Green industrialization in primary, secondary and tertiary levels of industry.
- Optimized land and water use, including river basins, marine & coastal areas, waterbasins, in urbanization and rural sustainable development.
- Sustainable consumption and a relatively small ecological footprint are essential elements of a moderately well-off society.
- Livable cities and rural communities with low levels of environmental risks.

5.3 Innovative tools for regional Green Development

A number of tools now in use within China are specifically designed for application at the regional level in addition to those of general application for environment and development these include:

- Ecologically-based Main Functional Zoning can be used for ensuring green development based on local attributes, ecological services value and fragility of ecosystems. But zoning information and the actual use of such zoning for local decisions still require considerable refinement.
- Eco-cities and eco-provinces are terms used in China, with interesting local experiments, However, the expansion of today's experimentation into full practice in every part of the country could be accelerated. The benefits and costs also require careful assessment, since showcasing can be an expensive approach of limited value.
- Eco-compensation experience in China has expanded greatly over the past decade, but is not yet a comprehensive national system. It must be considered a national system since it meets needs of both richer and poorer regions. The sources and levels of funding and the use of incentives in expenditures will be important considerations in future design and long-term application.
- Ecological construction is of great value to China, with use in restoration of damaged areas. In general this approach has seen its most significant application in rural areas of Western and Central China. However as the country addresses soil pollution and brownfield sites in the industrialized areas, and ecologically damaged marine and coastal areas in Eastern China, the experience gained in operating the forest and grassland rehabilitation efforts may be put to get use. These existing programs also require improvements, especially for grassland-dominated regions.
- Innovation clusters for green technology development & application have become

important in many cities and it should be possible to harvest the results of investment in such clusters during the coming decade. The possibilities for expansion into areas and development matters of sub-regions within Western China and elsewhere will open new opportunities for innovation.

- Investment models in green development will continue to evolve. This is a matter not fully resolved by any means. The potential roles of smaller start-ups and the much larger SOEs is one area of concern. Both are important. Another is the potential of FDI into areas beyond the Eastern Region to introduce new technologies and management approaches for green development. Investment in heavy industry will likely fall off somewhat after 2020, opening new possibilities for more balanced and green development. This will accompany the interest in stimulating domestic consumption levels. However, there is no guarantee that the trend will be towards sustainable consumption. Investment can help to shape the directions taken.

5.4 New Political Opportunities

CCICED's 2012 Annual General Meeting is taking place at a time of political transition in China. It is therefore appropriate to leave the final word on development to a new political leader. In his speech at the conclusion of the 18th CPC Congress, China's Vice-President, Mr. Xi Jinping noted that:

Our people have an ardent love for life. They wish to have better education, more stable jobs, more income, greater social security, better medical and health care, improved housing conditions, and a better environment. They want their children to have sound growth, have good jobs and lead a more enjoyable life. To meet their desire for a happy life is our mission.

These wishes hopefully will be turned into reality during the coming years, and in the process, green development achieved for all parts of China. Such an outcome will be an immense contribution for the whole world's environmental state as well.