N. 03 | MAY 2016

ECONOMIE EMERGENTI

Emerging Economies

EDITED BY
Elena Vallino
University of Torino and Turin Centre on Emerging Economies

AUTHORS
Augusto Ninni, *University of Parma and IEFE, Università Bocconi, Milano*
Francesco Abbate, *University of Torino*
Giorgio Brosio, *University of Torino*
Giovanni Marin, *IRCRES CNR Milano*
Ignazio Musu, *University of Venezia Cà Foscari*
Marianna Gilli, *University of Ferrara and SEEDS*
Massimiliano Mazzanti, *University of Ferrara and SEEDS*
Nicoletta Marigo, *CNR-IMEM, Parma*
Virginia Vergero, *University of Torino*

OEET
Osservatorio sulle Economie Emergenti – Torino
Turin Centre on Emerging Economies
L'Osservatorio è stato costituito nel 2014 a Torino da un gruppo di studiosi di economie internazionale e di sviluppo comparato, grazie ad un contributo della Compagnia di San Paolo. OEET è un centro no-profit indipendente dedicato allo studio e al monitoraggio delle maggiori economie emergenti e alla disseminazione dei risultati degli studi economici sui paesi emergenti a imprese, istituzioni ed al pubblico colto.

Established in 2014 and based in Turin, OEET -Turin Centre on Emerging Economies is an independent, non-profit centre dedicated to the study and monitoring of major emerging economies and to the dissemination of results of economic analyses and information to firms, institutions and the general public.

CONTACTS
OEET
Osservatorio sulle Economie Emergenti – Torino
Turin Centre on Emerging Economies
Via Ponza, 4/E
10121 Torino - Italy
Tel: 0039 011 5591611
elena.vallino@unito.it
www.osservatorio-economie-emergenti-torino.it

Economie Emergenti è sostenuto da
Compagnia di San Paolo

SFIDE AMBIENTALI NELLE ECONOMIE EMERGENTI: PROSPETTIVE DIVERGENTI

Questo numero di Economie Emergenti riguarda le problematiche e le politiche ambientali nei cosiddetti paesi emergenti. In tali paesi preoccupanti livelli di inquinamento ambientale sono stati associati alla rapida crescita economica, sollevando la preoccupazione di scienziati internazionali e della società civile. I paesi emergenti dovrebbero delineare delle politiche che affrontino il trade-off fra crescita economica ed inquinamento se vogliono evitare danni ambientali ulteriormente gravi, che potrebbero, a loro volta, limitare la crescita economica. Un utilizzo appropriato di incentivi come sussidi, tasse, e politiche dei prezzi può promuovere efficienza nell'utilizzo delle materie prime, ridurre l'inquinamento che deriva dalle attività di produzione e consumo e generare un miglioramento da un punto di vista ambientale senza compromettere la crescita. Una rapida crescita economica in alcune economie emergenti come India e Cina, ha permesso una consistente riduzione della povertà, e, inoltre, ha rappresentato un supporto per l'economia globale nel periodo della recente crisi. Tuttavia sussiste il pericolo che tali paesi ripetano gli stessi errori passati dei paesi sviluppati, nei quali l'industrializzazione ha prodotto un consistente inquinamento ambientale che non è stato affrontato seriamente fino a quando non sono stati raggiunti livelli relativamente alti. Per esempio, da un lato tali economie stanno diventando sempre maggiormente responsabili delle emissioni globali di carbone, contribuendo in tal modo al cambiamento climatico. Dall'altro lato il danno ambientale all'interno di tali paesi sta diventando severo per quanto riguarda l'inquinamento dell'aria e dell'acqua e lo sfruttamento delle risorse naturali.

Nel dicembre 2015 si è conclusa la XXI Conferenza delle Parti (COP 21) della Convenzione Quadro delle Nazioni Unite sui Cambiamenti Climatici (UNFCCC), generando il cosiddetto Accordo di Parigi. I paesi sono parti dell'Accordo attraverso piani nazionali di riduzione delle emissioni. E' interessante osservare il ruolo svolto dalle economie emergenti in tale processo di negoziazione e in tale Accordo, in quanto queste non appartengono ufficialmente al gruppo delle economie industrializzate ma, al tempo stesso, il loro contributo all'inquinamento globale è in continuo aumento. In generale l'Accordo può essere analizzato lungo tre linee interpretative. Innanzitutto osserviamo i parametri scientifici utilizzati. Troviamo l'obiettivo di lungo termine di mantenere il riscaldamento globale del pianeta al di sotto dei 2°C, nonché l'impegno di compiere sforzi aggiuntivi per mantenerlo al di sotto dei 1,5°C. I paesi intendono raggiungere la "zero balance" entro il 2050. Sfortunatamente l'Accordo non specifica in dettaglio gli strumenti necessari per raggiungere gli obiettivi e considera gli impegni assunti anziché gli obblighi. Secondariamente notiamo la questione dell'equità. Utilizzando un approccio "bottom up", ogni paese delinea il proprio piano volontario per la riduzione delle emissioni, in modo da permettere la differenziazione fra le capacità effettive e le possibilità di ogni paese. Tali piani implicano un'assunzione di responsabilità da parte dei paesi, anche se non è possibile garantire pienamente una coerenza ex-ante fra tutti i piani nell'ambito dello stesso obiettivo. La buona notizia è che l'Accordo di Parigi intende coprire 186 paesi e, di conseguenza, il 96 percento delle emissioni mondiali del 2010, mentre il Protocollo di Kyoto copriva soltanto il 14 percento delle emissioni globali. Infine, dobbiamo osservare se vi sono possibilità realistiche che l'Accordo sarà realmente implementato. Il protocollo di Copenhagen del 2009 conteneva obiettivi precisi e vincolanti sulla riduzione delle emissioni, ma soltanto per 39 paesi. Nell'Accordo di Parigi è coinvolto un numero molto maggiore di paesi, tuttavia molti aspetti non sono stati definiti su base vincolante, come ad esempio l'obbligo e l'accettazione da parte di ogni paese dei meccanismi MRV ("monitoring-reporting-verification").

In questo numero i contributi di Ignazio Musu, e di Nicoletta Marigo insieme ad Augusto Ninni si focalizzano sull'Accordo di Parigi di Dicembre 2015. Evidenziano gli elementi che rappresentano misure innovative rispetto agli accordi precedenti sul clima, e descrivono il ruolo particolare dei paesi emergenti ed in via di sviluppo nel processo di negoziazione e negli impegni presi.

Marigo e Ninni pongono l'attenzione sulla Cina e sui suoi impegni emersi dall'Accordo nell'ambito di promozione di energia a basso consumo di carbone, efficienza energetica e trasporti sostenibili. Inoltre riflettono sulle implicazioni di tali potenziali politiche sui processi di sviluppo. Successivamente si focalizzano invece sui grandi paesi ASEAN, analizzando il loro contributo alle politiche volte alla mitigazione del cambiamento climatico in diversi scenari che implicano la presenza o meno di assistenza finanziaria da parte dei paesi industrializzati.

L'articolo di Giovanni Marin, Massimiliano Mazzanti e Marianna Gilli riguarda gli impatti dei consumi mondiali ed europei su quattro grandi paesi emergenti: India, Indonesia, Brasile e Cina. Osservano l'andamento delle variabili riguardanti le emissioni di gas serra, l'occupazione e la crescita economica fra il 1995 e il 2010.

Francesco Abbate e Virginia Vergero scrivono sul tema della gestione dei rifiuti solidi urbani in Myanmar, parlando di un progetto di cooperazione decentrata fra le città di Torino e Yangon in tale ambito. Analizzano i punti di forza e di debolezza del progetto in termini di capacity-building delle autorità locali, considerando le dimensioni istituzionali, tecniche e sociali.

Giorgio Brosio affronta anch'esso la dimensione urbana, focalizzandosi però sulle metropoli cinesi e sui cambiamenti degli incentivi politici e fiscali necessari per lo sviluppo di città sostenibili da un punto di vista ambientale in tale paese. ■

Elena Vallino

ENVIRONMENTAL CHALLENGES IN THE EMERGING ECONOMIES: DIFFERING PERSPECTIVES

This issue of Emerging Economies addresses the topic of environmental issues and policies in emerging economies. Serious environmental degradation has been associated with rapid economic growth in many emerging countries, raising concerns among international scholars and civil society. Emerging countries should design policies that address the trade-off between growth and environmental pollution if they want to avoid even more serious environmental damages which, in turn, may eventually limit economic growth. An appropriate use of incentives like subsidies, taxes, and pricing may foster efficiency in the utilization of raw materials, reduce the pollution deriving from production and consumption activities, and would allow for improvements from an environmental perspective without compromising growth. Rapid growth in emerging countries such as India, and China has consistently reduced poverty and, moreover, has provided support for the global economy at the time of the recent crisis. However, these countries may repeat past mistakes of developed countries, where industrialization produced considerable environmental pollution that was not seriously addressed until relatively high income levels were reached. For example, on the one hand, these economies are becoming progressively more responsible for global carbon emissions, therefore contributing to climate change. On the other hand, their domestic environmental damage is becoming severe concerning air and water pollution, and the depletion of natural resources.

In December 2015 the 21st Conference of the Parties (COP21) to the UN Framework Convention on Climate Change (UNFCC) concluded with the so-called Paris Agreement. Countries are party to the Agreement with national plans for emission reduction. It is challenging to observe the role played by emerging economies in this negotiation process and in this Agreement, since they still do not officially belong to the groups of industrialized countries but, at the same time, their contribution to global pollution is steadily increasing. In general the Agreement can be analyzed from three points. Firstly, we observe the scientific parameters which are utilized. We find the long term objective of maintaining planet global warming below 2°C and make additional efforts in order to maintain it below 1.5°C. Countries aim to reach "zero balance" by 2050. Unfortunately the Agreement does not specify in detail the instruments to reach the goals and it considers commitments rather than obligations. Secondly, we notice the issue of equity. Using a "bottom up" approach, every country designs its own voluntary plan for emissions reduction, to allow for differentiation among the actual capacity and possibility of each country. These plans imply an assumption of responsibilities by countries, even if it is not possible to fully guarantee ex-ante coherence among all plans within the common objective. The good news is that the Paris Agreement intends to cover 186 countries and therefore 96 percent of the world emissions of 2010, while the Kyoto Protocol only covered 14 percent of the global emissions. Thirdly, we have to observe whether there is the expectation for realistic possibilities that the agreement will actually be implemented. The Copenhagen 2009 protocol contained precise and binding objectives on emission reduction, but only for 39 countries. In the Paris Agreement many more countries are involved. However, many aspects have not been defined in a binding way, like, for example, the obligation and the acceptance from every country of the MRV mechanisms (monitoring-reporting-verification).

In this issue, the contributions of Ignazio Musu, Nicoletta Marigo, and Augusto Ninni focus on the Paris Agreement of December 2015. They highlight the elements that represent innovative measures with respect to previous agreements on climate, and they describe the particular role of emerging and developing countries in the negotiation process and in their commitments.

Marigo and Ninni focus their attention to China and its commitments that emerged from the Agreement in the fields of promoting low carbon energy, energy efficiency, and sustainable transport. They also reflect on the implications of these potential actions to the development process. Subsequently, they shift the focus to large ASEAN countries, analyzing their contributions to climate change mitigation policies, with and without financial assistance from industrialized countries.

The article by Giovanni Marin, Massimiliano Mazzanti, and Marianna Gilli addresses the impacts of world consumption and of European consumption on four large emerging economies: India, Indonesia, Brazil and China. They observe variables concerning GHG emissions, employment and economic growth between 1995 and 2010.

Francesco Abbate and Virginia Vergero write about the issue of urban solid waste management in Myanmar, reporting about a project of decentralized cooperation between the Cities of Torino and Yangon in this field. They investigate the strengths and the weaknesses of the project process in terms of capacity-building of local authorities and along institutional, technical, and social dimensions.

Giorgio Brosio writes as well about the urban dimension, but focuses on Chinese megalopolis and on the changes in the political and fiscal incentives which are necessary for the development of environmentally sustainable cities in this country. ■

Elena Vallino

THE PARIS AGREEMENT AND EMERGING ECONOMIES

Ignazio Musu, *Ca' Foscari University of Venice*

Sintesi

Sono ben note le difficoltà di raggiungere un accordo internazionale credibile sul cambiamento climatico. Una delle ragioni di queste difficoltà è la relazione tra economie avanzate e economie emergenti. L'Accordo di Parigi del dicembre 2015 (COP21) è un passo avanti perché sembra essere l'espressione di un accordo anche da parte delle economie emergenti (Cina in primo luogo) il cui ruolo è fondamentale. La sfida sarà il modo in cui si metterà in pratica l'accordo: un fallimento segnerebbe una sconfitta definitiva delle possibilità di affrontare il problema.

Abstract

In the scientific community there is awareness about the difficulty of reaching a credible international agreement on climate change. One of the reasons about this difficulty is the relation between advanced economies and emerging economies. The Paris Agreement of December 2015 (COP21) represents a progress since it seems to be a commitment also by the side of emerging economies, particularly China, whose role is fundamental. The challenge is given by the way in which the agreement will be implemented: a failure would mean a defeat of the possibility to address the problem.

1. *The difficulty of achieving a global agreement on climate change*

The most important result of the 2015 United Nations Climate Change Conference (COP21) in Paris in December 2015 has been that 195 countries succeeded in finding a common basis for a strategy aimed at reducing greenhouse gas (GHG) emissions and mitigating the increasingly risky impacts of climate change.

The former Kyoto Protocol was clearly a failure with respect to these targets, the main reason being its structure, characterized by the request of reducing emissions only to advanced countries (some of them such as the United States have never accepted those commitments) and by vague and insufficient proposals to involve developing and emerging economies in the task.

Achieving a credible agreement on a global environmental problem such climate change is difficult for a number of reasons. One is that the reduction of carbon emissions is a typical global public good under-produced by uncoordinated initiatives of national governments: as each country benefits from emissions' reduction by other countries, it is expected to avoid undertaking reduction costs, trying to transfer them on other countries.

A second reason is that "decarbonizing" the economy requires not only increasing the efficiency with which fossil fuels are used as energy sources, but moving to new renewable energy sources with the implication of changing the whole energy infrastructure. This will require substantial efforts in significant technological innovations and huge investments requiring the capacity of mobilizing correspondingly huge financial resources.

A third reason is that worldwide the public opinion does not seem to perceive the climate change problem as a crucial and urgent challenge; this is due to the high rate used in discounting future benefits of reducing the damages of climate change compared with the current required costs of reducing greenhouse gas emissions.

Finally, a crucial reason lies in the asymmetry between mature and developing countries. The stock of carbon released into the atmosphere since the Industrial Revolution has been largely caused by the countries that are now developed. However, in the last three decades the role of developing countries in the emission of polluting substances has rapidly increased and in the next future it will become dominant.

Developed countries claim that developing countries should feel responsible for undertaking emission reduction actions; but developing countries point out that their emissions per capita are much lower than in developed countries, therefore the responsibility for reducing emissions should be of developed countries.

The resolution of this conflict between developed and emerging economies should be at the center on any global agreement claiming to be credible. However this means that such an agreement should be radically different from the approach used in Kyoto based on quantitative imposed targets. For example, extending the logic of Kyoto by adding quantitative "top down" imposed targets of emission reductions for developing and emerging countries would not work at all.

2. *The Paris Agreement*

The Paris Agreement of 2015 acknowledges the contradictions highlighted above and it adopts a "bottom up" approach, implemented through goals established at the national level, the so-called Intended Nationally Determined Contributions (INDCs). This new approach could start from the national reports prepared by the 180 countries before the Paris Conference.

The Paris Agreement does not eliminate all quantitative indications. It states as a general objective that of limiting the increase in global average temperature to 2°C above pre-industrial levels and of developing any efforts to limit it to 1.5°C. Through this measure it accepted the indications of the Intergovernmental Panel for Climate Change in order to significantly reduce the risks and impacts of climate change.

However we do not find in the Paris Agreement any quantitative indication concerning the path for emissions reduction compatible with that general objective. What we find is a general commitment to achieving the peak of global emissions of greenhouse gases as soon as possible and then bringing about a rapid reduction so that a parity between emissions produced and those absorbed is achieved in the second half of the century. This result should be obtained through the INDCs.

An important part of the Paris Agreement is the review process of the agreement's implementation, which will be set up starting in 2023 and will be repeated subsequently every 5 years in order to assess progress in collectively achieving the long-term objectives. The review will cover the assessment of national contributions to mitigation, but also adaptation actions and financial commitments. The results of the reviews will be used to make suggestions on how to update subsequent national contributions and future cooperation actions between the parties. An initial assessment will be made as early as 2018 to contribute in adjusting the future national contributions.

Each country is encouraged to undertake strategies of environmental regulation including market mechanisms to foster emission reductions and reduce emission abatement costs. Countries are also encouraged to experiment cooperative institutional mechanisms to jointly achieve emission reductions in the most cost effective way.

3. *Developing and emerging economies in the Paris Agreement*

Developed countries are assigned a leading role in mitigation actions, while developing countries are allowed to increase their emissions in the short run, but to adopt INDCs aimed at reducing them as soon as possible.

Developed countries should provide support and flexibility for those developing countries which need more time to decrease their emissions and which need financial and technological support for the implementation of their commitments.

The Agreement also insists on increasing the capacity to adapt to the adverse impacts of climate change, promoting investments in developing countries, in particular the most vulnerable among them, with the aim of minimizing losses and damages from climate change and of reducing threats to food production. This effort should take place through measures of technological cooperation and transfer of technology in favor of developing countries.

Before 2025 governments will have to establish a new collective financial commitment starting from an amount of 100 billion dollars per year. It should be noticed that, according to the OECD, developed countries in 2014 provided slightly more than 60 billion dollars to developing countries, mostly from public funds. Information on how this support develops should be communicated by each country every two years.

Mobilizing financial resources, developing investment in low-carbon research and promoting low-carbon technology transfer will be crucial to enable developing countries to implement mitigation and adaptation plans.

In the Paris Agreement there is no distinction between emerging economies and less favored developing economies in the wide category of developing countries.

However, the contribution of the large emerging countries is crucial in successfully dealing with the challenge of climate change. Emerging countries have to avoid to imitate the model of economic growth based on wide and inefficient use of fossil fuels that characterized the industrialized world, and move to a low-carbon more sustainable model of economic growth.

There are in fact emerging economies whose rate of growth and availability of savings provides a consistent basis for investments towards a low-carbon economy even in absence of an external financial support. China is the paradigmatic example.

The principle of "common but differentiated responsibility", often invoked by China and other emerging countries, is perfectly compatible with an action of financial support (and related technological support) privileging the less favored developing countries.

As for emerging economies there is specifically a national responsibility of modifying the model of economic growth in a more sustainable low-carbon direction, even more important than financial support and technology transfer is a true cooperation between emerging and mature economies at the level of scientific research and technological low-carbon development which will lead to technological interdependence and cooperation.

Commitments to implement and develop such a cooperation (a good signal is recently coming from the proposal of a joint initiative in this field by US and China, which is doing a lot in the area of renewable energy technologies) are extremely important for the Paris Agreement, in order to move from the level of wishful declaration to that of practical realization. ■

AFTER COP21: ENERGY AND ENVIRONMENT COMMITMENTS FOR CHINA AND ASEAN COUNTRIES AND THEIR CONSEQUENCES

Nicoletta Marigo, *CNR-IMEM, Parma* **e Augusto Ninni**, *Università di Parma and IEFE, Università Bocconi, Milano*

Sintesi

Il lavoro analizza il ruolo dei paesi emergenti e di quelli in via di sviluppo nella conferenza COP21 di Parigi (dicembre 2015) in tema di cambiamento climatico, nonché gli impegni precedentemente annunciati dalla Cina e da alcuni paesi ASEAN attraverso gli Intended National Determined Contributions (INDC). L'articolo esamina il pacchetto di interventi previsti dal governo cinese, e sottolinea le differenze e le somiglianze nelle dichiarazioni di intervento dei paesi ASEAN.

Abstract

The paper focuses on the role of emerging and developing countries at the COP21 meeting in Paris (December, 2015) and on the commitments previously provided by China and some ASEAN countries through their Intended National Determined Contributions (INDC). The article assesses the efforts to face climate change disclosed by the Chinese government, and emphasizes the differences and the similarities in the policy declarations of the ASEAN countries.

1. A general picture

At the 21st Conference of the Parties (COP21) to the UN Framework Convention on Climate Change (UNFCC) held in Paris in December 2015, 188 countries reached an historic agreement on international action to tackle climate change.

Achievements worth mentioning are:

1. **The significance of the commitment.** The Parties agreed not only to limit the growth of the world's temperature to the previously set 2° C above pre-industrial levels, but also "to pursue efforts to limit the temperature increase to 1.5° C" (art. 2).

2. **The direction of the countries' development.** The limits to the temperature increases shall be obtained through net-zero GHG emissions in the second half of the century (art. 4). This opens the way to a deep transformation of the economies[1].

3. **The communication of the results.** The commitments of the single countries will be analysed through Nationally Determined Contributions (NDC[2]), to be communicated every five years.

4. **The importance of resilience.** The capacity of the countries to adapt[3] to the adverse impacts of climate change will be increased through specific investments.

5. **The role of financing.** Adequate financial resources must be available to support a climate-resilient and low-carbon economic development.

Despite doubts on the future actual implementation of the Paris agreement[4], it succeeded in removing the division between developed and developing countries regarding climate issues. Every country has to assume responsibilities in taking action against climate change, albeit within its capabilities. So the Paris agreement was able to remove the former distinction between Annex-1 and non-Annex-1 countries of the Kyoto Protocol: developed countries are explicitly requested to take the lead in reducing the emissions and in contributing to climate finance (art. 4). Developing (and emerging) countries are instead requested to publish their expected contributions to the fight against climate change and encouraged to give financial support.

Indeed the expected contribution of the emerging countries differs largely: for example, in the BRIC group China and India will reduce their GHG emissions per unit of GDP by 2030 (with respect to 2005), while Brazil and Russia will reduce their GHG emissions in absolute terms, having as reference year 2005 and 1990 respectively.

The existence of these large differences[5] suggests to focus the following discussion on China and on other relatively large developing countries, like some ASEAN nations.

2. China

China's commitments to climate change mitigation and adaptation for the post-2020 period includes:

- Peaking CO_2 emissions by 2030 if not before.
- Reducing CO_2 emissions per unit of GDP by 60-65% from 2005 levels by 2030.
- Increasing non-fossil energy to 20% of its energy consumption by 2030.

What is China doing to achieve these goals and what might be the implications on the country development process? In what follows we focus on few selected and relevant areas.

Phasing out coal. Coal-fired power accounts for 67% of China's total energy consumption and is responsible for three-quarters of the country CO_2 emissions. Although coal generation and consumption will stay at high levels in the years to come, economic slow down, industry restructuring and new energy and environmental policies have recently resulted in reduced coal consumption. China is committed to modernize its coal power plants by 2020 and to reduce their pollutant emissions by 60%. This will contribute in saving 100 million tonnes of raw coal and preventing the discharge of about 180 million tonnes of CO_2 each year[6].

Bans on new coal power plants are currently in place in three industrial regions and are expected to be extended to a number of other key provinces in 2017. China has also introduced bonuses for plants meeting coal efficiency standards: plants opened after January 2015 will get 0.005 yuan[7] per kilowatt hour on top of the basic grid tariff, while those already in operation will get an extra 0.01 yuan per kilowatt hour. The country is complementing these measures with an extensive surveillance system to monitor the compliance level of the numerous power plants spread across the country.

1 According to Germanwatch, "producers, investors and governments" are now informed that "coal, oil and gas need to be phased-out already in the coming decades" (see H. Breuers and P.M. Richter,"The Paris Climate Agreement: Is It Sufficient to Limit Climate Change?", DIW Roundup, February 15, 2016).

2 Before the Paris meeting, the countries were requested to provide their Intended National Determined Contributions (INDC), which we will utilize to assess the commitments of China and ASEAN emerging countries. Also in terms of style of language the passage from INDC to NDC means higher level of responsibility for the countries.

3 The Paris agreement underlines the differences between mitigation of the climate change (points 1 and 2) and adaptation to it (point 4).

4 In 2018 the IPCC (Intergovernmental Panel on Climate Change) will provide an official report about the feasibility of reaching the target.

5 An useful survey of these differences is in M. Davide and P. Vesco, "Assessing the INDCs: a comparison of different approaches", ICCG Reflection no. 42/December 2015.

6 In 2014 China issued the Energy Development Strategy Action Plan , which targets a 62% coal share in primary energy consumption by 2020.

7 1 yuan = 0.14 €

Promoting low carbon energy. China is rapidly becoming a leader in renewable energy production and installations. At the end of 2015 the country was leading the world with 145,104 gigawatt (GW) of cumulative installed wind power and 43 GW of solar photovoltaic, thus overtaking Germany. To further boost adoption of non fossil fuels, China is committed to adopt a clean electricity dispatch system that will prioritize power generation from renewable sources. This is critically important considering that the current electricity system gives priority to coal-fired power plants.

Investments in low carbon energy sources (mainly driven by the Chinese solar industry) have also be considerable reaching US$89.5 billion in 2014 thus exceeding the US and Europe.

Energy efficiency. China's building stock is characterized by new constructions and large scale urban expansion, both growing rapidly. Buildings account for about one-quarter of China's energy use and the number of new buildings is expected to triple by 2030. China's energy efficiency effort is therefore prioritising buildings by ensuring that 30% of all new urban buildings will meet by 2020 China's green building standards[8].

In 2014, more than $18 billions were invested in energy efficiency in the Chinese buildings (the majority of which residential), taking the country at the second place in the world energy efficiency investment ranking[9].

Transport. China has the world's second largest vehicle population (after the USA) and the transport sector accounts for 12% of the country CO_2 emissions. The country is committed to reach by 2020 a 30% of public transport in urban centres. This will require to slow the growth rate of private transportation by investing in subways, buses and car sharing services. China aims to cut fuel consumption of light commercial vehicles by 20% from 2012 levels by 2020. For this reason the country has been imposing fuel efficiency standards since 2004[10].

Implications for the development process. According to a study by Wang Yi[11], done by simulating the effects of several policies on emissions reduction and their effects on the country development, peaking CO_2 emissions by 2030 will decrease the GDP by 3.7% to 5.9% under different scenarios and cause a 5.5% to 8.2% reduction in employment. Although controlling emissions (with adjustments in the energy structure and decreases in the energy intensity being among the most important policy measures) and achieving a more sustainable development is of paramount importance for China, the price of the policy mix on the development process will be significant and well above the 1% of the global GDP reckoned necessary by Stern to control the temperature increase by 2°C .

Integrated and comprehensive policy solutions will also be needed for realizing carbon emission peaking. Among these the creation of a carbon trade market will play a key role. China has already established pilot trading systems in seven cities – the first set up occurred in 2011- and intends to establish a national cap and trade system as early as 2017.

3. The large ASEAN countries

As explained before, one of the most important features of the commitments coming from Paris Agreement 2015 was that a country is requested at least to slow down the pace of its GHG emissions, according to its own process of development and the physical features of its territory. A good example of differences among countries in their commitments is provided by some large (Indonesia) and relatively large (Philippines, Vietnam, Thailand, Malaysia) ASEAN countries.

They share at least three important features, which are rather uncommon in Europe:

- They are already well prone to disasters caused mainly by climatic change: according to the Long Term Climatic Risk Index (CRI)[12] the highest number of disasters in 1995-2014 was marked by Philippines (337), the highest losses in million US$PPP were marked by Thailand: Philippines, Vietnam and Thailand were respectively the 4th, the 7th and the 9th country in the world in terms of total CRI score.
- In the region the major impacts and risks of climate change are the increased risks of river flooding and sea flooding, leading to damages to infrastructure, livelihoods, and settlements[13] , so that adaptation to climate change (resilience) is some times more important than mitigation.
- Changes in the use of land and forests account for an important item of GHG emissions. As these countries committed themselves in their 2015 INDCs to reduce the LULUF[14] contribution and to create reforestation efforts, it involves a deep change in their model of development, previously strongly based on the exploitation of natural resources (mainly in Indonesia and Malaysia).

Considering the mitigation policy (Table 1), these countries commit themselves to reduce their own emissions even without receiving technological or financial help from abroad (first percentage of the second to last column)[15] in 2030 with reference to the Business As Usual (BAU) scenario. It means they do not commit to reduce the absolute amount of the emissions, but only the growth rate[16]. Furthermore, among the analysed countries only Vietnam explicitly claims to face climate change in a pro-active way, by developing a domestic renewable energy equipment industry, even if the incidence of renewables (excluding hydro) in the electricity generation is rather small in all the countries[17]. ■

8 They will need to satisfy six rating criteria: land, energy, water, resource/material efficiency, indoor environmental quality and operational management.

9 Hua, S. 2015. China seeks energy efficiency in construction. China Daily USA. Available at: http://usa.chinadaily.com.cn/epaper/2015-10/15/content_22195790.htm

10 PChina is now in Phase IV standard which regulates the fuel consumption of passenger vehicles (both domestically manufactured and imported) for the years 2016 through to 2020. Phases I and II, which ended in 2011, showed successful reduction of 11.5% in average fuel consumption and related emissions.

11 Wang, Y. and Zou, L. 2014. The economic impact of emission peaking control policies and China's sustainable development. Advances in Climate Change Research 5: 162-168.

12 Germanwatch: CRI is an average of death toll, death per 100.000 inhabitants, total losses in million US$PPP, losses for unit GDP%, number of events (total 1995-2014).

13 Asian Development Bank, "Southeast Asia and the economics of global climate stabilization", 2015.

14 Land use, land-use change and forestry.

15 Of course the committed reduction is larger if this help from abroad is obtained (see the second percentage number).

16 For example according to Vietnam's INDC, the expected million t CO_2e emitted in 2030 shall be 787.4 according to the BAU scenario (a 219% increase with respect to 2010). Vietnam commits itself to increase its emissions in 2030 by 193% with own resources, by 139 % if helped by other countries.

17 Geothermal is important in Philippines and Indonesia, biofuels in Thailand.

Table 1 - INDC of large ASEAN countries and their current emission performances

	t CO_2e[18] GHG emissions per capita (2010)	Δ GDP (1990-2011)	Δ CO_2 emissions / Δ GDP (1990-2011)	% renewables (incl. hydro) in electricity generation (2013)	% renewables (excl. hydro) in electricity generation (2013)	Mitigation target in INDC (by 2030: policies to start in 2021)	Reference
Indonesia	8,3	4,8	1,5	12,3	4,5	29-41% emission intensity of GDP	BAU 2010-2030
Philippines	1,6	3,9	0,9	26,4	13,1	-70%	BAU 2000-2030
Vietnam	2,8	7,2	1,5	45,1	0,1	8-25%	BAU 2010-2030
Thailand	5,2	4,5	1,3	8,5	5	20-25%	BAU 2005-2030
Malaysia	14,3	6	1,2	8,6	0,9	35-45% emission intensity of GDP	2005
Sources:	*ADB*	*WB*	*WB*	*IEA*	*IEA*	*INDC*	*INDC*

GREENHOUSE GAS DYNAMICS AND EU DEMAND: ENVIRONMENTAL, LABOUR AND SOCIAL IMPLICATIONS

Giovanni Marin, *IRCRES CNR Milan*, **Massimiliano Mazzanti**, *University of Ferrara and SEEDS* e **Marianna Gilli**, *University of Ferrara and SEEDS*

Sintesi

L'articolo presenta una breve discussione riguardo all'impatto dei consumi europei e mondiali su Brasile, India, Indonesia e Cina, sia a livello aggregato che singolo. Vengono considerate le dimensioni di emissioni di gas serra, occupazione e crescita economica in tali economie emergenti, e vengono analizzati gli andamenti di queste variabili fra il 1995 e il 2010.

Abstract

This article presents a brief discussion about the impacts of European and world consumption on Brazil, India, Indonesia and China, both at an aggregate and at a single level. The dimensions of greenhouse gas emissions, employment and economic growth in these emerging countries are considered and their growth trends between 1995 and 2010 are analyzed.

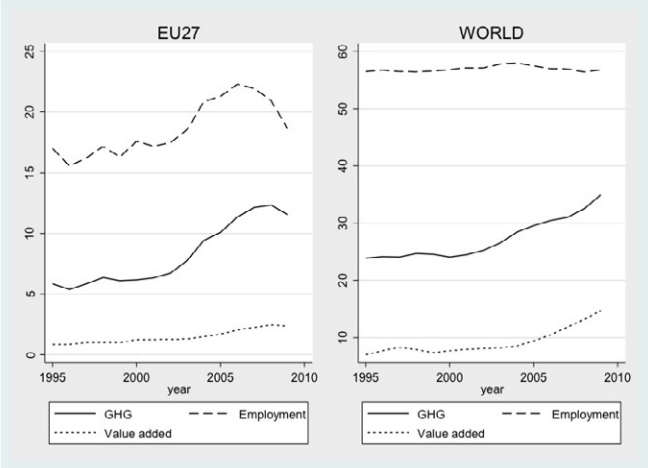
The objective of this article is to report some insights on the environmental, labour and social implications of European and world demand in emerging countries such as Brazil, India, Indonesia and China.

To assess the impacts of European and world consumption on these emerging economies, three indicators are used: environmental footprint is evaluated using the aggregate trend of greehouse gas (GHG) emissions; social footprint is measured by the employment created in the countries; finally, the economic footprint is approximated using value added (VA). The following plots describe the trends of the shares of GHG, employment and VA induced by EU27 (and worldwide) final demand in these emerging economies over the total GHG, employment and VA generated by EU27 (and worldwide) final demand, from 1995 to 2009.

Figure 1 considers the aggregate level (Brazil, India, Indonesia and China together). The trends of GHG and employment induced by the EU27 tend to accelerate from year 2000 and start to decrease since 2008-2009; the direction of these indicators has been influenced by the economic crises at the end of the 2000s, which caused European demand to shrink, thereby reducing emissions and employment generated by EU27 demand all over the world.

On the contrary, emissions and employment induced by the world demand are growing steadily over the period; this is not entirely surprising since the crisis involved mainly the advanced economies, while countries such as China continued to grow at high rates. In particular, the employment generated by the world demand is approximately constant over the period.

Figure 1 - Share of environmental pressures and economic activity occurred in China, India, Indonesia and Brazil to satisfy the final demand in the EU27 and the world.



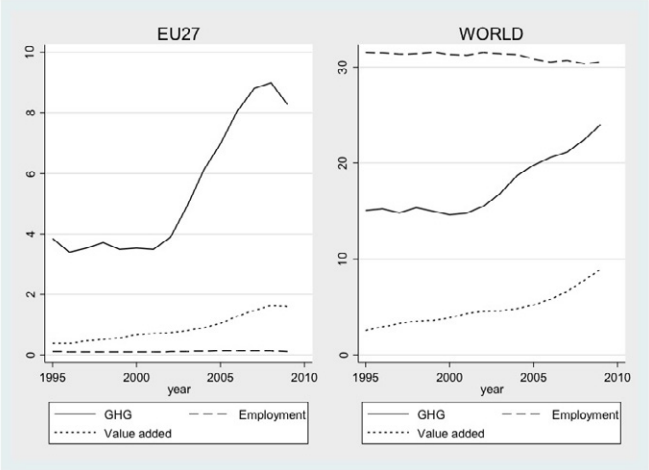
Source of data: WIOD.

18 CO_2 *equivalent.*

The growth of environmental pressure at the aggregate level is mainly driven by GHG production induced by the European demand in China and India, as it is shown in Figure 2 and Figure 3 (in particular 9% of emissions induced at the end of the period in China and 1.7% in India). At the same time, it has to be noticed that, all over the period, employment generation has been stable in these countries and value added generation barely reached 2% in China and 0.5% in India at the end of the period. Compared to the increasing environmental pressures, European demand did not create adequate social and economic benefits in return.

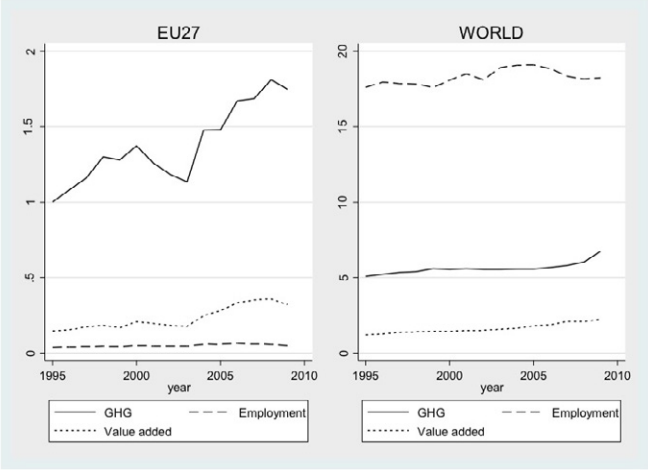
Concerning the effects of world demand, social benefits offset a rising environmental pressure but economic benefits growth is still below GHG trend.

Figure 2 - Share of environmental pressures and economic activity occurred in China to satisfy the final demand in the EU27 and the world.



Source of data: WIOD.

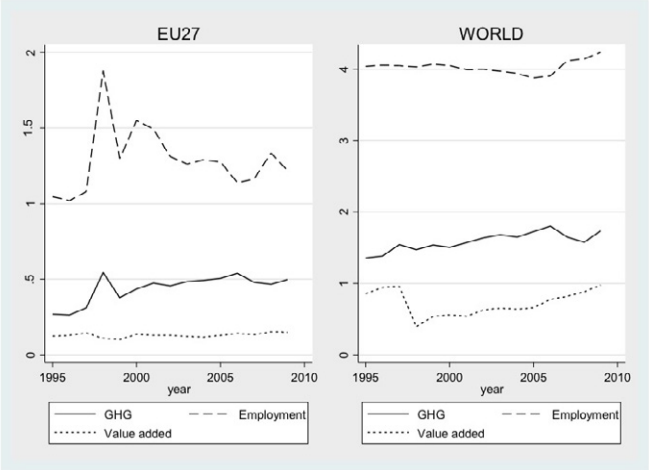
Figure 3 - Share of environmental pressures and economic activity occurred in India to satisfy the final demand in the EU27 and the world.



Source of data: WIOD.

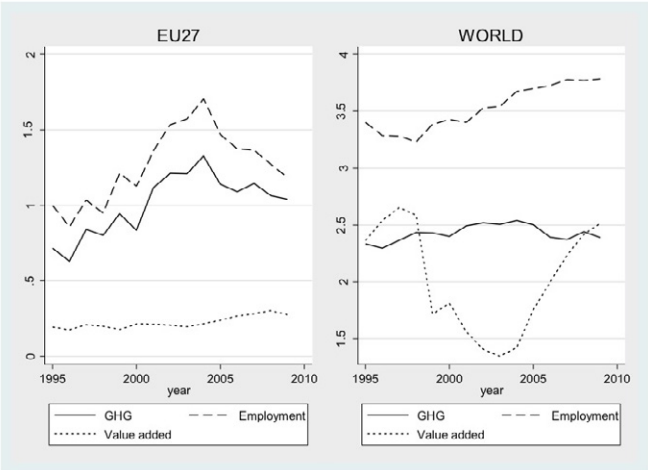
In Brazil and Indonesia, European demand had a more positive impact on employment, as it is presented in figures 4 and 5. The trend of the generated employment is increasing and GHG growth has been lower than in China and India, especially looking at the trends for Indonesia. In general, the impact of both EU27 and world demand had a positive social footprint while, concerning the economic benefits, the effects remains ambiguous (e.g., the value added generated in Brazil show an hectic trend).

Figure 4 - Share of environmental pressures and economic activity occurred in Indonesia to satisfy the final demand in the EU27 and the world.



Source of data: WIOD.

Figure 5 - Share of environmental pressures and economic activity occurred in Brazil to satisfy the final demand in the EU27 and the world.



Source of data: WIOD.

To conclude, in Asian countries such as China and India, European demand induced a faster growth in GHG emissions than demand from the rest of the world did, while the social and economic footprint did not offset the negative environmental impact. On the contrary, in Brazil and Indonesia, European as well as world demand had a more positive impact, helping to generate more employment in exchange of a relatively lower environmental impact. However, the economic impacts of both demands remains relatively small and sometimes unstable. ■

CAN DECENTRALIZED COOPERATION IMPROVE URBAN SOLID WASTE MANAGEMENT? THE CASE OF THE TURIN-YANGON PARTNERSHIP IN MYANMAR

Francesco Abbate, *University of Torino* **e Virginia Vergero**, *University of Torino*

Sintesi

L'articolo verte sull'analisi di tematiche emerse nel corso della valutazione finale di un progetto promosso dalla Città di Torino, avente come obiettivo il rafforzamento delle capacità delle autorità locali di Yangon, la metropoli più popolosa del Myanmar, nella gestione dei rifiuti solidi urbani. In particolare sono evidenziati i punti di forza e di debolezza della cooperazione decentrata in tale ambito.

Abstract

The article analyzes issues which emerged during the final evaluation of a project promoted by the City of Torino. The project has the objective of improving the capacity of the local authorities of Yangon – the most populous city in Myanmar – in the management of solid urban waste. In particular we highlight the points of strength and of weakness of decentralized cooperation in this field.

In the increasingly broad scenario of international cooperation, local authorities (LAs) have been emerging as new actors in the past few years and are likely to play a key role in the future both as donors and beneficiaries. Among the global challenges we are facing today, LAs are on the frontline in a variety of areas: rapid urban growth and mobility problems, migrants' inclusion as well as environmental protection, including urban solid waste management. Working with LAs, empowering them and strengthening their capacity in managing problems and finding local solutions to global problems are all viewed as a significant step toward sustainable development, as has been recognized by the European Commission (Communication on Local authorities: actors for development, 2008)

The purpose of this article is to assess the extent to which decentralized cooperation can improve solid waste management in cities of the developing world. The analysis is based on the independent final evaluation of a project stemming from the partnership between the City of Turin, Italy and the City of Yangon, Myanmar. This assessment has been facilitated by the direct involvement of the authors in the project as members of the evaluation team.

The project titled "Environmental protection and sustainable development: building local capacities on solid waste management in Myanmar" (in short SWM) stands as an interesting example of decentralized cooperation on environmental issues. With a budget of €1.2 million funded by European Union and co-funded by the Italian Development Cooperation, the three-year project, completed in February 2016, benefited Yangon, former capital and the most populous city of Myanmar (with 5.2 million inhabitants, roughly six times larger than Turin) as well as economic heart of the country.

The overall ambitious objective of SWM was to contribute to the integration of environmental protection principles into policies and programmes in Myanmar. Its specific objective was to strengthen the capacities of the Yangon City's Pollution Control and Cleansing Department (PCCD), in solid waste management.

The project strategy was threefold, as was mirrored in SWM three components: Component 1 – Institutional, implemented by City of Turin with the assistance of AMIAT, the public-private company managing the garbage collection and final disposal in Turin; Component 2 – Technical, implemented by ITHACA, an ICT company linked to Polytechnic University of Turin; and Component 3 - Social, implemented by CESVI, an Italian NGO active in Myanmar since a long time. The City of Turin was responsible for the overall project management.

Among the three components, the institutional one was the most challenging and with a longer-term perspective. Its main results include:

- The Legal Framework Report, containing short, medium and long-term suggestions for the integration of environmental principles and practices into the national and Yangon legislations, on the basis of EU and Italian legal sources. It is important to note, that such sources were not always the latest, thus increasing the likelihood of these suggestions being really feasible and more easily acceptable. In order to support this process, the experts highlighted which first steps are needed to reach a good level of regulation. Such regulation could represent the keystone of a broader environmental policy that could provide a solid basis for an efficient solid waste management and, at the same time, could become a starting point for future implementation.
- The City of Turin Regulations on the Management of Municipal Waste have abundantly inspired the drafting of the PCCD Bylaws, which, however, have not yet been approved by the Regional Government, although they were submitted in October 2014.
- An AMIAT official advised PCCD on procedures regarding the privatization of the waste collection and disposal service and assisted PCCD in the selection of the winning company. The selection process, however, was suspended following the results of an opinion poll.

Component 2 was the most sophisticated and training-intensive component in the entire project. Despite some initial difficulties related to weak computer skills, poor knowledge of the English language and lack of follow-up to training activities, ITHACA provided an IT system with a twofold outcome. It was instrumental for mapping all Yangon City, so that PCCD could manage more easily the garbage collection, and for collecting and analysing data regarding waste production in order to forecast future requirements and adjust the waste management strategy accordingly. In other words, the main achievement of this component was the transfer of technology and methodology that PCCD adopted and now can apply again for different data and locations according to their own needs and strategies.

The rationale of Component 3, the "social" one, was based on the concept that the services of a local authority cannot reach their potential if the local community is not aware of the reasons, good practices and effects at the origin of the service. The key results of this component were:

- School awareness campaigns: schoolchildren and, indirectly, their families had access to knowledge on health, environment and good practices related to SWM and in particular the 3R (Reduce, Recycle, Reuse) strategy.
- Community days: three pilot townships, totalling roughly 700,000 inhabitants, were informed and sensitized on good practices through cleaning campaigns and distribution of promotional material.
- Two successful pilot projects: 1) production of items with recycled plastic bags and 2) production of compost by collecting green waste in one of the pilot townships. Both projects involved vulnerable families living in such townships.

To sum up, there is good evidence that SWM has generated the added value that is expected from decentralized cooperation. In fact, in the Communication mentioned above, the European Commission identified several "added values of decentralised cooperation", that can be traced in the present project too. Specifically, they are the following:

1. **catalyst for change:** decentralized cooperation has undoubtedly promoted a network to foster innovative policies and solutions in the SWM sector in Yangon, with the active role played by City of Turin, ITHACA, CESVI and AMIAT;
2. **long-term partnership and twinning:** the project should be seen and assessed in the broader context of the long-standing presence in Myanmar of one partner (CESVI), as well as of the willingness to establish a broader and lasting partnership between Turin and Yangon, beyond the specific sector of SWM. This is testified by the new project "Sustainable Urban Mobility Planning" (SUMP), funded by the European Union and involving the same partners as those who implemented SWM. In addition, a comprehensive and forward-looking Memorandum of Understanding was signed by the Mayors of Turin and Yangon in May 2015 to foster cooperation in a variety of fields, including trade, tourism, social services, environment and cultural activities;
3. **responsiveness to local needs:** being directly involved in the governance of their city and territory, Turin LAs were particularly effective in understanding their peers' needs, and in sharing their institutional and technical know-how to address those needs;
4. **awareness raising:** As Turin LAs are in daily and direct contact with their citizens and hold significant responsibilities in this area, they played, together with CESVI, a crucial role in awareness raising on SWM issues in Yangon;
5. **multi-actor partnership:** the project has created a successful multi-actor partnership in order to address the issues of SWM, involving local institutions, technical expertise and civil society actors both in Turin and Yangon.

Despite its significant achievements, however, SWM experienced a number of shortcomings, which, to a great extent, reflect the limits of decentralized cooperation. Among the crucial weaknesses of this project are:

1. **The lack of involvement of national and regional authorities,** resulting in a considerable delay in the approval and thus enforcement of the PCCD Bylaws. Furthermore, although the project had a clear municipal focus, its overall objective and a number of its activities had a national dimension, by addressing, as an example, law-making issues going beyond the mandate of YCDC. The virtual absence of the Ministry of Environmental Conservation and Forestry in project implementation can be seen as a sign of the built-in limitations of decentralized cooperation, where LAs typically exchange best practices and provide technical assistance on a peer-to-peer basis. This shortcoming also had an adverse impact on the demonstration effect and thus the replicability of the project in other major cities in Myanmar, such as Mandalay and Naypyidaw, the national capital.
2. **The small size of the project** - another common feature of decentralized cooperation initiatives. In addition, SWM was not part of, nor benefited from, a broader environmental project, thus lacking the critical mass necessary to promote a policy dialogue with the Central Government on nationwide environmental issues and programmes.
3. **The lack of an adequate exit strategy,** involving preparatory work on a successor project and possible sources of funding. This activity would have again required the pro-active involvement of the national authorities in exploring the availability of potential donors beyond those who funded SWM and ensuring donor coordination, which was another missing element in project execution, especially in view of the parallel massive assistance provided by the Japan International Cooperation Agency (JICA) in this area. ■

The views expressed here are those of the authors and do not necessarily reflect those of the City of Turin or any other organisation. For further information, please visit the project website www.swmproject.eu)

REFORM OF FISCAL POLICIES FOR GREEN GROWTH IN URBAN CHINA

Giorgio Brosio, *University of Torino*

Sintesi

L'urbanizzazione è alle spalle della sostanziale crescita dell'economia cinese, ma il modo in cui è avvenuta è anche alle radici di consistenti danni ambientali. La promozione di una crescita urbana sostenibile da un punto di vista ambientale richiede una riforma degli incentivi politici e degli strumenti fiscali. L'articolo che segue fornisce alcuni suggerimenti focalizzati sulla riforma di strumenti di tassazione subnazionale.

Abstract

Urbanization is behind the fantastic growth of the Chinese economy, but the way it has proceeded is also at the roots of the huge offenses suffered by the environment. Promoting urban green growth requires a reform of the political incentives and of the fiscal instruments that have presided to urbanization. The text that follows provides a few suggestions focused on reform of subnational tax instruments.

1. Urbanization and growth

The speed and scale of urbanization process and the gravity of associated environmental challenges make China unique. More than 500 millions people have moved to the cities in the last decades. The country has the largest number of megalopolis in the world. Cities have been the main vehicles of economic growth in China since reform started in the 1980s. Special economic zones turned small villages into megalopolis. Innovative firms and sectors are thriving into them. Rural migration to cities has provided abundant and cheap labor force to feed industrial growth. But a large share of these migrants, estimated to be more than 200 millions, are "illegal" second class citizens, having moved without a residence permit and are deprived of access to education, health care and other basic social services.

Urban growth is expected to continue as China converges towards the income levels of developed countries. The urbanization rate is projected to reach 65% by 2030, which would imply an urban population of 950 millions (UNEP, 2013, The Economist, 2015).

Ill-defined ownership rights of farmers have encouraged the urban sprawl. Local officials, whose career is still dependent on achievement of growth objectives, have been able to expropriate rural land easily and at little cost. This has pushed migration to cities and has provided wrong incentives, making redevelopment of existing urban areas less attractive. Too many and also polluting factories have been induced to remain in the urban areas rather than move to cheaper sites on outside areas. Still China's megacities are less dense than equivalents elsewhere in the world, although heavily polluted. Urban sprawl has resulted in a loss of cultivated land in a country, whose capita stock of farmland is much below the world average.

Traffic represents one of biggest challenges. Massive spending on infrastructure has hugely improved connections within and between cities, but has created further traffic. Public transportation has been expanded, but frequently with low organization efficiency. Buses, metros and rail networks are managed by separate agencies and poorly integrated.

2. Monumental challenges regarding the environment

The rapid, more than tenfold, increase of private cars in the past decade has added to the damages created by the inefficient regulation of industries and more in general by the inefficient use of energy. The air of Chinese cities ranks amongst the most polluted in the world. Particulate is the biggest threat to health. China is also now the largest producer of carbon dioxide (CO2) emissions (OCDE, 2013 and original sources quoted there). High concentrations of primary pollutants have also led to a high incidence of other types of pollution, including smog and acid rain. Water pollution is also a severe problem, with over 40% of inland rivers considered to be unsuitable even for human contact (OCSE, 2013).

There is irrefutable evidence of significant adverse health effects in China from exposure to ambient pollution and environmental accidents. Notwithstanding some notable improvements in pollution levels in recent years, urbanization and rising incomes are continuing to increase environmentally created health problems and their economic cost. Environmental challenges are already imposing constraints on the growth of Chinese cities, notably in ensuring adequate supplies of fresh water.

The country has also spent since early 1990's a huge share of its national income on average 8.5% on urban infrastructure. This is far more than Europe and America (2.6%) or India (3.9%).

A series of manmade tragedies that have struck Chinese cities in recent years are telling, although episodically, examples of the fact that despite the huge expenditure big problems and emergencies still remain. The tragedies include the collapse of a mountain of mud and construction debris in Shenzhen in December 2015, an explosion at a hazardous materials warehouse in Tianjin in August of the same year and fatal floods that overwhelmed new sewer infrastructure in Beijing in 2012 (Minter, 2015).

These disasters are unique in their own way, at the same time their occurrence signals the incapacity on the part of the Chinese government to build and maintain safe cities for their residents.

3. Need for a radically change in fiscal incentives

The solution to the above-mentioned problems and emergencies requires a fundamental reshaping of the economic and fiscal incentives facing especially local officials, implying a deep reform of the system of financing subnational governments. One of its main ingredients would be replacing the proceeds from the sale and development of land with a fully-fledged property tax and with one or a few specific environmental instruments targeted to reduce traffic congestion and pollution. The new tax instruments would bring substantial revenue to tackle expenditure needs but also, and equally important, provide the needed correct incentives.

As a matter of fact local governments face most of the challenges being responsible for much of infrastructure and provision of services. China is in terms of expenditure one of the most decentralized countries of the world, where the central government accounts only for 30 per cent of national expenditure, while the subnational governments account for the remaining 70 percent.

At the same time subnational governments have few own tax revenue resources and little discretion over tax rates and policy. Central government transfers are allocated mainly for current spending, leaving a small margin to finance infrastructure. Direct borrowing is legally forbidden, although the prohibition is only partially enforced, as shown by the fact that subnational governments run a deficit estimated to be around 2-3% of GDP.

To fund infrastructure investment these governments have made extensive use of off-budget mechanisms with very little monitoring and central oversight adding to the risks of insolvency. Clearly, the borrowing system needs reform that will not come easy. More specifically, the big step would be to close the back door and open the front door: i.e. the reform should allow local governments to borrow from banks and to issue bonds. Borrowing will, however, remain a problem as local governments own banks that in turn subscribe the bonds.

The main source of revenue are the proceeds from the sale and development of land, more precisely the land leasing fees, representing one third of total tax revenue (32.5% in 2010, against a mere 4.5 percent in 1999). These fees are not only the main source of revenue for local governments, but they are also a main contributor to the urban sprawl, inserting a vicious circle by which financing needs of local governments are satisfied with the sale of land whose development requires additional spending and in turn creates new revenue needs. The urban sprawl has been amplified by cheap credit for the acquisition of residential property, a big share of which is done for investment purposes. As a matter of fact, vacant property has continued to expand even in the recent years of economic growth deceleration. It has been estimated[19] that one billion square meters are presently vacant in the urban areas. One has also to remark in this context that new home prices in 70 large cities rose by an average of 1.6 per cent year-on-year in December according to China's National Bureau of Statistics (as reported by the Financial Times, January 16, 2016). The property market looks more attractive than unsteady stock markets in China.

Taxes on property, the detail of which is reported in Table 1, represent only 15% of total tax revenue, but a with a prevalence of taxes on transaction of properties.

Table 1. Taxes on Land and Property in China, as of 2008.

Tax	Introduced	Tax base	Tax rate 2007	Determinant of tax	Share on tax revenue
Urban Land use tax	1988	Built land for non-residential purposes (only on domestic taxpayers before 2007)	30 RMB/m2 to 0.6 RMB/m2	Ownership/use (recurrent)	3.51%
Real estate tax	1986	Real estate for business use, paid by foreigners and overseas Chinese people	1.2% of original value (not present) or 12% of rental income	Ownership/use (recurrent)	2.93%
Land value added tax (Lvat)	1994	Land appreciation value	Progressive tax rate (30–60% on the LAV)	Sale (non recurrent)	2.31%
Farmland occupation tax	1987	Farmland size	1–10 RMB/m2 (5–50 RMB/m2 after 2008)	Land Development (non recurrent)	1.35%
Deed tax	1997	Self-reported value of land and house transfer	3% to 5%	Sale (non recurrent)	5.62%

Source: based on Joyce Yanyun Man (2012) with some integration by the Author

All this points again to the need of deep reform of taxation, with a focus on property tax. There are many reasons. The first reason is the large potential revenue of a fully-fledged property tax providing funds for the much-needed expenditure and making the sale of land less indispensable. The second one is stability of revenue. The third reason is the efficiency features of the tax. It stimulates use of vacant property. Also, and possibly more importantly, it establishes a direct link between investment and other policies by local governments and value of properties. Good policies and needed investment increase value and the tax base and vice versa for bad policies, strengthening political and fiscal accountability. Properly defined property for taxation purposes also facilitates access to credit needed to finance a sustainable urbanization strategy.

Recurrent property taxes, meaning taxes levied on ownership of property and not on transfer of it, are presently marginal accounting only for less than 6 percent of subnational tax revenue. This is because residential property owned by Chinese is exempt and only property used for business is taxed. Moreover, the tax base is not the market value, but at best initial value with some adjustments, leading to a big understatement of real values. Finally, the tax rates are low. Taxes on property transactions fare little better in terms of revenue, but they provide wrong incentives stimulating local government to endless promotion of building activity and have an unstable basis depending on fluctuation of prices.

While the role of a fully-fledged property tax is crucial for the development of an urban strategy underpinning sustainable growth, challenges of design and implementation are formidable, because of insufficient definition of property rights. One has also to take into account popular opposition to it, since no tax has been paid on residential property since 1949, while acquisition of first, second and third property is a widespread form of saving, as mentioned above. Finally, there are also problems of administration, starting from assessment of values that is still problematic. The lack of a proper registration database is one reason it may take some time. The lack of national standards on basic information, like who owns which property, is also an obstacle that will likely take some time to resolve.

However, things are on the move. As it happens in most areas in China, big reforms are preceded by pilot projects and experimentations in a few selected areas. Early 2011 Shanghai started to tax newly purchased second homes of residents and first homes of nonresidents on the basis of their market value, with the exclusion from the tax base of 60 square meters per person.

19 *According to a declaration of Zhu Min, Deputy Managing Director of IMF widely reported in the Chinese press.*

Chongqing is targeting the existing single-family residences and newly purchased luxury apartments of residents, or newly purchased second homes of nonresidents. The program excludes 180 square meters for the single-family residences and 100 square meters for apartments in Chongqing. Only about 8,000 parcels are reported to have levied a property tax in these two cities combined. Despite the small coverage the direction of the reform seems to be correct.

The *People's Daily* announced on August 2014 that the country is likely to introduce a nationwide property tax as early as following year (2015). An English "Community Charge" type property tax, where the tax is paid by the occupant of the dwelling and by the owner when occupancy and ownership coincide would suit quite well China, where property rights are not yet well defined. It will establish a strong link to benefits received. It would reduce the number of vacant properties, easing rents and dampening the increase of property prices.

Congestion and distance related taxes

These instruments are more effective in solving traffic problems that specific measures already introduced in Chinese cities, such as parking fees, driving bans or limitations to traffic and restrictions to car purchases. They are suggested by an increasing literature (see for example International Council on Clean Transportation, 2010) and are sponsored by governments, particularly in the Scandinavian countries. There exist a still limited number of cases of implementation of congestion charges: London, Milan and Singapore, where a congestion fee is applied to vehicles passing through cordons that identify central and congested areas. They are considered with increased interest in Chinese cities, overwhelmed by a staggering increase of vehicles in urban centers. Hong Kong has pondered from a long time the introduction of a congestion charge and detailed studies with alternative options are available.

Distance related taxes are more powerful instruments covering both urban and rural areas but discriminating between them. They supplement national fuel taxes with local instruments impacting on urban planning and have revenue potential that supplement funds for sustainable growth infrastructure. ■

References

International Council on Clean Transportation, *Congestion Charging: Challenges and Opportunities*, 2010.

Joyce Yanyun Man, *China's Property Tax Reform: Progress and Challenges*, Land Lines Lincoln Institute of Land Policy, 2012.

The Economist, *The great sprawl of China. How to fix Chinese cities*. Jan 24, 2015.

Minterm Adam, *The Tax That Can Make China's Cities Safer* Bloomberg View, December 23, 2015.

OECD, *Urbanization and Green Growth in China*, Paris, 2013.