

NOTA DI LAVORO

70.2015

Sendai Framework for Disaster Risk Reduction – Success or Warning Sign for Paris?

Jaroslav Mysiak, Fondazione Eni Enrico Mattei
and Euro-Mediterranean Centre on Climate
Change, Venice, Italy

Swenja Surminski, Grantham Research Institute
on Climate Change and the Environment, London
School of Economics, London, United Kingdom

Annegret Thieken, Institut für Erd- und
Umweltwissenschaften Geographie und
Naturrisikenforschung, Universität Potsdam,
Germany

Reinhard Mechler, Risk Policy and Vulnerability
Program, International Institute for Applied Risk
Analysis, Laxenburg, Austria

Jeroen Aerts, Water and Climate Risk,
Institute for Environmental Studies,
Amsterdam, The Netherlands

Climate Change and Sustainable Development

Series Editor: Carlo Carraro

Sendai Framework for Disaster Risk Reduction – Success or Warning Sign for Paris?

By Jaroslav Mysiak, Fondazione Eni Enrico Mattei and Euro-Mediterranean Centre on Climate Change, Venice, Italy

Swenja Surminski, Grantham Research Institute on Climate Change and the Environment, London School of Economics, London, United Kingdom

Annegret Thieken, Institut für Erd- und Umweltwissenschaften Geographie und Naturrisikenforschung, Universität Potsdam, Germany

Reinhard Mechler, Risk Policy and Vulnerability Program, International Institute for Applied Risk Analysis, Laxenburg, Austria

Jeroen Aerts, Water and Climate Risk, Institute for Environmental Studies, Amsterdam, The Netherlands

Summary

In March 2015, a new international blueprint for disaster risk reduction (DRR) has been adopted in Sendai, Japan, at the end of the Third UN World Conference on Disaster Risk Reduction (WCDRR, March 14-18, 2015). We review and discuss the agreed commitments and targets, as well as the negotiation leading to the Sendai Framework for DRR (SFDRR) and discuss briefly its implications for the later UN-led negotiations on sustainable development goals and climate change.

Keywords: Disaster Risk, World Conference on Disaster Risk Reduction, Sendai Framework for Disaster Risk Reduction

JEL Classification: Q5, Q54

Address for correspondence

Jaroslav Mysiak
Fondazione Eni Enrico Mattei
Isola di San Giorgio Maggiore 8
30124 Venice
Italy
Phone: +39 041.2700.445
E-mail: jaroslav.mysiak@feem.it

Sendai Framework for Disaster Risk Reduction – success or warning sign for Paris?

Jaroslav Mysiak¹, Swenja Surminski², Annegret Thielen³ and Reinhard Mechler⁴ and Jeroen Aerts⁵

¹ Fondazione Eni Enrico Mattei and Euro-Mediterranean Centre on Climate Change, Venice, Italy

² Grantham Research Institute on Climate Change and the Environment, London School of Economics, London, United Kingdom

³ Institut für Erd- und Umweltwissenschaften Geographie und Naturreisikenforschung, Universität Potsdam, Germany

⁴ Risk Policy and Vulnerability Program, International Institute for Applied Risk Analysis, Laxenburg, Austria

⁵ Water and Climate Risk, Institute for Environmental Studies, Amsterdam, The Netherlands

Introduction

Rising losses from extreme weather events and unequivocal evidence about climate change provide the backdrop of current international efforts to achieve agreement on emissions reductions and foster greater climate resilience. 2015 has the potential to mark a key milestone in these efforts – with several related policy processes culminating, offering a chance to integrate disaster risk reduction, climate change policy and poverty reduction more closely. At the same time there is a growing risk of further inaction if no political agreement can be found.

Earlier this year, state governments and international disaster risk communities got together in Sendai, Japan, to sanction a new international covenant on disaster risk reduction (DRR). Nearest major city to the area devastated by the 2011 Tōhoku earthquake and tsunami, not far from the ill-fated Fukushima Daiichi nuclear power station, the choice of venue could hardly have been better.

The *Third UN World Conference on Disaster Risk Reduction* (WCDRR, March 14-18, 2015) was the first gathering in the course of the climate-risk-sustainable-development negotiations, to be followed by the International Conference on Financing for Development (FfD) in July, the United Nations summit for the adoption of the post-2015 development agenda in September, and the 21st session of the Conference of the Parties (COP21) to the United Nations Framework Convention on Climate Change (UNFCCC) in December. By year end, all going well, the world's political leaders will have agreed on ambitious, binding climate mitigation targets as a part of a new global commitment to sustainable development.

The road to Sendai

No doubt that climate change, sustainable development, and financing for development are closely interconnected, and substantial progress in any of them hinges on attainments made in the others (Sachs and Schmidt-Traub, 2014). The renewed *global partnership* for sustainable development, one of six essential elements of the sustainable development agenda (UN, 2014a), will not be workable without mobilising substantial financial and other resources. The official development assistance (ODA) from developed to developing countries, raised to the previously agreed target of 0.7 per cent of gross national income (GNI), will be but a part of a comprehensive support for development, the exact terms of which will have to be agreed on. It is emblematic in this context that climate change, the truly global and one of the greatest challenge mankind has ever faced, spurs and drives advancement on fundamental subjects of international law such as solidarity,

accountability, and collaboration. The *right to development* (RTD), the declaration of which will celebrate the 30th anniversary next year, places a duty on countries to work closely together to create international environment conducive to development (Orellana, 2013). To succeed, this year's negotiations will have to attend to this duty.

Disaster risk reduction (DRR) plays an important role in this context. Over and over, medium- and large-scale disasters have undermined or made void decade-long poverty reduction efforts, especially in the unindustrialized countries. The global annual average economic losses from natural hazards to the built environment alone, as estimated in the 2015 edition of the *Global Assessment Report* (UNISDR, 2015), would rank 36th in the list of countries sorted by their nominal GDP. Extreme weather and climate related events amplified by human-induced climate change threaten to rocket the economic losses, and so does the persistence of high land consumption rates and risk-negligent development practices.

In the official UN language DRR has been raised as a global policy priority since the late 1980s, when the United Nations General Assembly proclaimed the 1990s as the International Decade for Natural Disaster Reduction. Since 2005, the *Hyogo Framework for Action* (HFA, 2005-2015) provided guidance for reducing the loss of life and assets in the event of disaster, and making the world safer from natural hazards. Although HFA prompted considerable progress towards a more proactive and holistic approach to DRR, the achievements remain patchy across regions and unevenly distributed across the priorities for action (Calliari and Mysiak, 2013). Most of all, the HFA has not succeeded in steering a *substantial* reduction of disaster losses in terms of human lives and social, economic and environmental damage and spending on DRR is still largely trumped by spending on disaster relief and reconstruction (Kellet and Caravani, 2013).

Therefore, the WCDRR was to address disaster risk with '*a renewed sense of urgency*' (UN, 2012), adopting a new and better international blueprint for DRR. In the run-up to Sendai the expectations were growing. The EU joined the voices calling for greater accountability, transparency and (improved) governance of risk under the new Framework (EC, 2014a, 2014b, 2014c). The zero-draft of the proposed new framework (SFDRR-0; UN, 2014), made public already in October 2014, suggested *action-oriented* targets that are *operationally feasible, measurable and achievable* (ibid). Vainly, as it turned out. Little decisiveness remained in the finally agreed text of the Sendai Framework for Disaster Risk Reduction 2015-2030 (SFDRR) at the end of a marathon negotiation that stretched out until late hours on the last conference day, and presented to the relatively small audience of participants that remained to learn the outcomes.

The outcome: Sendai Framework for Disaster Risk Reduction 2015-2030

Eventually, the SFDRR lays down seven targets against which progress should be monitored and assessed:

- Substantially reduce global disaster mortality,
- Substantially reduce the number of affected people globally,
- Reduce direct disaster economic loss in relation to global GDP,
- Substantially reduce disaster damage to critical infrastructure and disruption of basic services
- Substantially increase the number of countries with national and local disaster risk reduction strategies,
- Substantially enhance international cooperation to developing countries,
- Substantially increase the availability of and access to early warning systems and disaster risk information.

*edited. See full targets in Supplementary material and UN (2015a).

Disappointingly none of the targets specifies a quantitative degree of progress to be made. Instead, the text resorts to 'substantial' qualifiers of advancement. The first five years of the SFDRR are intended as a run-up time for putting in place the national and local DRR strategies, while their attainments over 2020-2030 will be compared with the 2005-2015 baseline. Even worse, in most cases the targets are specified as collective (global) outcomes, rather than individual country-based achievements.

The **first four** targets of the new framework lean towards future disaster impact, determined to reduce mortality, affected people, economic damage, and damage to health and educational facilities. Although the target levels were not suggested, the SFDRR-0 made clear that the relative progress was to be measured in function of the number of disaster events experienced. This is problematic because hazard strikes are results of stochastic processes with much larger time horizons than the ten years over which the countries' progress will be judged. Likewise, at least some of these processes are not stationary, neither in terms of frequency nor intensity. Hence, the progress would have to be measured in terms of changes in 'risk', expressed in *annual expected value* (AEV). But this would require a good understanding and constant monitoring of risk with its key drivers hazard, exposure and vulnerability, which cannot be taken for granted even in many developed countries.

The pre-conference draft outcome document (SFDRR-1; UN, 2015), released in January 2015, has given up postulating target levels. It also turned a blind eye to countries' individual achievements, and DRR progress will be accounted through –aggregate– collective assessments of all countries. The finally adopted SFDRR (UN, 2015a) is somewhat better defined and measures the relative progress as per-capita disaster impacts. Because it adopted the collective nature of achievements made, it allows for compensation of under- by overachiever. This means that greater achievements in one country or region can compensate the less-than-expected outcomes elsewhere. Granted, measurements of individual achievements can complement the global assessments and single out the underperformers. And the low performance of a few would not preclude achieving the overall goal.

The **fifth** target applies to extension of national and regional DRR strategies and is accepted as a protraction of the HFA's call on better coordination of disaster risk activities with development, civil protection, and other sectorial policies, Targets **six** and **seven** were only added in SFDRR-1 and became the most controversial pieces of the new framework. The former resorted to the language of the 2012 Earth Summit non-binding outcome document '*Future We Want*' (UN, 2012) that invited '*governments at all levels as well as relevant subregional, regional and international organizations to commit to **adequate, timely and predictable** resources for disaster risk reduction in order to enhance resilience of cities and communities to disasters, according to their own circumstances and capacities*' (p. 33). The proposed target six reiterated the same language by requesting *adequate, timely and predictable* financial and other resources from developed countries by means of international cooperation. Connected to this, but elsewhere in the text, the SFDRR-1 positioned management of multi-hazard disaster risk under the regime of *common but differentiated responsibilities*. This formulation, brought in from climate negotiations under the UNFCCC, was subject to heated discussion in Sendai. Debate revolved around whether to frame and operationalize the international commitments around explicit (i.e. enforceable) liabilities or moral (i.e. voluntary) pledges to help countries and communities in need. Had this articulation been adopted, the developed countries would in some way accepted a duty to assist the countries unable to develop and implement risk reduction in their own territories, if not liability for the

damage and losses triggered by the environmental (including climate) change. None of the SFDRR-1 language made its way to the finally adopted Framework that merely insisted on the need to '*enhance international cooperation ... through adequate and sustainable support*'. A small comfort for the proponents of a stronger language came from the fact that the final text of the SFDRR includes an explicit endorsement of all the principles contained in the '*Future We Want*' document, as well as the principles sanctioned by the 1992 Rio Earth Summit.

The **seventh** target focuses on available disaster risk information and assessments, and access to multi-hazard early warning systems. Understanding the hazard and risk, and measuring the progress towards accomplishing the DRR targets will only be possible if substantial efforts are put in improving risk assessments and disaster impacts' records. The SFDRR advocates multi-hazard, inclusive, science-based and risk-informed decision-making for which it is necessary to collect and share (non-sensitive), disaggregated risk information including the detailed records of the past events' impacts. Over the past years, the UN Office for Disaster Risk Reduction (UNISDR) has been constantly improving the knowledge base on disasters' impacts. The recent edition of the Global Assessment Report (GAR2015; UNISDR, 2015) is based on the evidence from eighty detailed country-wide disaster damage databases.

Are we on track with integrating climate and development policy?

The principle of *common but differentiated responsibilities and respective capabilities* (CBDR-RC) has been a part of the climate negotiation since the beginning, and is included in the preamble of the UNFCCC. It recognises that the countries have an obligation to support those who are most vulnerable and who have made a limited contribution to the creation of the climate change problem (Burton et al., 2012). But the application of the principle has been limited to climate mitigation efforts only (Pauw et al., 2014). The endorsement of this principle in the context of climate adaptation or disaster risk reduction would essentially mean accepting liability for the amplified natural hazard risk and the losses that cannot be prevented through mitigation or adaptation. The wording used in the SFDRR-1 seems to have aimed at fortifying the claims advanced under the *International Mechanism for Loss and Damage* (L&D) formally established at the UNCCC's Conference of Parties (CoP) in Warsaw, November 2013. While it is not yet clear whether and in what form the L&D framework will be integrated in the climate agreement, currently a work-programme is being rolled out, which most prominently features a consideration for natural disaster in terms of comprehensive risk management. Also, while developed countries are unwilling to work towards implementation of this mechanism, 'Southern' negotiators have made it clear in recent meeting rounds that any agreement in Paris and thereafter will need to consider this issue and find a solution. (ENB, 2015)

Will Sendai matter?

The WCDRR will not be remembered as a major breakthrough in terms of actionable efforts, yet it showed important shift in terms of framing the debate, which will be conducive for other international discourses proceeding this year, including decisions on the SDGs and the climate change negotiations. The negotiation showed, perhaps unsurprisingly, that the DRR purview is not insulated from contentious themes in development and climate political realms. The disputes over the references to the CBDR-CB and the *right to development* have distracted attention from areas where major achievements could have been made, first of all the measurable targets able to guide and attest countries' efforts to prevent and reduce the disaster risk. By endorsing the principles underlined in the non-binding outcome document of the 2012 Earth Summit (UN, 2012), without using their language explicitly, the bone of contention was sent back to the policy arenas better equipped to address them.

Sendai will only be as good as the DRR action that it spurs and that are delivered at local, national or global level. The interpretation of 'substantially' used in the targets will be interesting, and clearly cause a lot of debate. Monitoring progress will be challenging, data availability and transparency are big concerns in many places of the world. The SFDRR resorts to the same ways of monitoring the quality and implementation of the DRR strategies as the previous HFA framework 2005-2015, generally admitted as being too weak: self-reporting or, in addition, voluntary and self-initiated peer reviews. However, the accounting and monitoring system itself is too weak and progress per country cannot be properly measured. The seventh target is very valuable, because all accounting start with reliable risk assessments.

The DRR community should persist in making the governments accountable for the implementation of the Framework. Some shortcomings of the agreement can be mended through the way the baseline for assessment is defined and progress reported. In the European Union, the Regulation 1313/2013/EU (EC, 2013) obliges the member states to conduct multi-hazard risk assessment by the end of 2015, and every three years thereafter. Seizing this year's assessments, the EU could show the determination that was not there in Sendai and serve as an example. Europe could only gain from major efforts put in better understanding of disaster risks and improved reporting of disaster impacts, including the economic damage and losses (De Groeve et al., 2014, 2013; EEA et al., 2013; JRC, 2015).

Whether Sendai turns out to be the 'pivotal point' for global climate risk management remains to be seen. Many delegates commented that 'any agreement is better than no agreement'. The key question is if and how the agreement in Sendai can send the right signals to the next round of political negotiations this year, most notably the development financing summit in Addis Ababa this summer, the sustainable development goals negotiations in the autumn and the climate change negotiations later this year in Paris.

References

- Burton, I., Dube, O.P., Campbell-Lendrum, D., Davis, I., Klein, R.J.T., Linnerooth-Bayer, J., Sanghi, A., Toth, F., 2012. : Managing the risks: international level and integration across scales. In: *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.
- Calliari, E., Mysiak, J., 2013. Renewed international commitment for Disaster Risk Reduction, in: Hare, M., van Bers, C., Mysiak, J. (Eds.), *A Best Practices Notebook for Disaster Risk Reduction and Climate Change Adaptation: Guidance and Insights for Policy and Practice from the CATALYST Project*. The World Academy of Sciences (TWAS), Trieste, Italy.
- De Groeve, T., Poljansek, K., Ehrlich, D., 2013. Recording Disaster Losses Recommendations for a European approach. doi:10.2788/98653
- De Groeve, T., Poljansek, K., Ehrlich, D., Corbane, C., 2014. Current status and best practices for disaster loss data recording in EU Member States.
- ENB- Earth Negotiations Bulletin, 2015. Summary of the Geneva Climate Change Conference 8-13. February
- EC, 2014a. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: The post 2015 Hyogo Framework for Action: Managing risks to achieve resilience. COM(2014) 216 final.

- EC, 2014b. Outcome of the European ministerial meeting on disaster risk reduction Towards a post-2015 framework for Disaster Risk Reduction, building the resilience of nations and communities to disasters. 08 July 2014, Milan, Italy.
- EC, 2014c. Council conclusions on the post 2015 Hyogo Framework for Action: Managing risks to achieve resilience. Council of the European Union. Justice and Home Affairs Council meeting Luxembourg, 5-6 June 2014.
- EC, 2013. Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013 on a Union Civil Protection Mechanism. Off. J. Eur. Union 924–947.
- EEA, JRC, ETC/CCA, 2013. Towards a potential European flood impact database. EEA - JRC – ETC/CCA Joint Technical Paper, European Environmental Agency, http://cca.eionet.europa.eu/reports/EEA_JRC_ETC-CCA%20JTP.
- JRC, 2015. Guidance for Recording and Sharing Disaster Damage and Loss Data. Towards the development of operational indicators to translate the Sendai Framework into action. EU expert working group on disaster damage and loss data.
- Kellett, J. & Caravani, A. (2013) *Financing disaster risk reduction: A 20-year story of international aid*, ODI and the Global Facility for Disaster Reduction and Recovery at the World Bank, London / Washington.
- Orellana, M. (2013) Climate change, sustainable development and the clean development mechanism. In United Nations Human Right Office of the High Commissioner: *Realizing the Right to Development: Essays in Commemoration of 25 Years of the United Nations Declaration on the Right to Development*, New York and Geneva, pp. 321-340
- Pauw, P., Bauer, S., Richerzhagen, C., Brandi, C., Schmole, H., 2014. Different Perspectives on Differentiated Responsibilities. A State-of-the-Art Review of the Notion of Common but Differentiated Responsibilities in International Negotiations. Discussion Paper / Deutsches Institut für Entwicklungspolitik 6/2014.
- Sachs, J.D., Schmidt-Traub, G., 2014. Financing Sustainable Development: Implementing the SDGs through Effective Investment Strategies and Partnerships. Preliminary, unedited draft for public consultation as on November 30, 2014.
- UN, 2015a. Sendai Framework for Disaster Risk Reduction 2015-2030, A/CONF.224/CRP.1. 18 March 2015.
- UN, 2015b. Post-2015 framework for disaster risk reduction. Further streamlined text (as negotiated as of 28 January 2015).
- UN, 2014a. The road to dignity by 2030: ending poverty, transforming all lives and protecting the planet. Synthesis report of the Secretary-general on the post-2015 sustainable development agenda. UN A/69/700. 4 December 2014.
- UN, 2014b. Third United Nations World Conference on Disaster Risk Reduction, Zero draft submitted by the co-Chairs of the Preparatory Committee, 23 October 2014. Second session Geneva, 17-18 November 2014, United Nations General Assembly A/CONF.224/PC(II)/L.3.
- UN, 2012. Resolution adopted by the General Assembly on 27 July 2012, A/RES/66/288. The future we want. United Nations, General Assembly. Sixty-sixth session. 11 September 2012.

UNISDR, 2015. Making Development Sustainable: The Future of Disaster Risk Management. Global Assessment Report on Disaster Risk Reduction. Geneva, Switzerland: United Nations Office for Disaster Risk Reduction (UNISDR).

Supplementary Material

Target	<i>Zero-draft as on 20/10/2014</i> [SFDRR-0]	<i>Pre-conference as on 28/01/2015</i> [SFDRR-1]	<i>Final text released on 18/03/2015</i> [SFDRR]
[1] Mortality	<i>Reduce</i> disaster mortality by [a given percentage in function of number of hazardous events] by 20[xx];	[a] <i>Substantially reduce</i> disaster mortality [per capita] by 2030 [to achieve a minimum average global mortality from disasters between 2020 and 2030 lower than the average mortality between 2005 and 2015.] [b] <i>Substantially reduce</i> disaster mortality [per capita] by 2030. [FN] To achieve this target, the minimum average global mortality from disasters between 2020 and 2030 should be lower than the average mortality between 2005 and 2015.	<i>Substantially reduce</i> global disaster mortality by 2030, aiming to lower average per 100,000 global mortality between 2020-2030 compared to 2005-2015.
[2] Affected people	Reduce the number of affected people by [a given percentage in function of number of hazardous events] by 20[xx].	[a] <i>Substantially reduce</i> the number of affected people per capita at the global level by 2030. [FN] To achieve this target, the minimum average of number of affected people from disasters between 2020 and 2030 should be lower than the average number of affected people between 2005 and 2015. [b] <i>Substantially reduce</i> the number of affected people per capita at the global level by 2030. [FN] Categories of affected people will be considered/elaborated/agreed in the process for post Sendai work to be decided upon by the Conference.	<i>Substantially reduce</i> the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 between 2020-2030 compared to 2005-2015. [FN] Categories of affected people will be elaborated in the process for post Sendai work decided by the Conference.
[3] Economic loss	<i>Reduce</i> disaster economic loss by [a given percentage in function of number of hazardous events] by 20[xx].	<i>Reduce</i> direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.	<i>Reduce</i> direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.

[4] Critical infrastructure	<i>Reduce</i> disaster damage to health and educational facilities by [a given percentage in function of number of hazardous events] by 20[xx].	[a] <i>Substantially reduce</i> disaster damage to critical infrastructure, <i>particularly</i> health and educational facilities [by a given percentage] by 2030.	<i>Substantially reduce</i> disaster damage to critical infrastructure <u>and disruption of basic services</u> , <i>among them</i> health and educational facilities, including through developing their resilience by 2030.
		[b] <i>Substantially reduce</i> disaster damage to critical infrastructure and disruption of basic services, <i>among them</i> health and educational facilities, including through developing their resilience by 2030.	
[5] DRR strategies	<i>Increase</i> number of countries with national and local strategies by [a given percentage] by 20[xx].	<i>Substantially increase</i> the number of countries with national and local disaster risk reduction strategies by 2020. [Increase by a given percentage accordingly with national capacities the number of national instruments to reduce direct disaster economic loss by 2030].	<i>Substantially increase</i> the number of countries with national and local disaster risk reduction strategies by 2020.
[6] International cooperation	-	[a] [<i>Substantially</i>] enhance international cooperation in support of disaster risk reduction [[in/to] developing countries/from developed to developing countries], including through providing adequate, [additional and] timely and predictable financial resources, technical assistance, technology transfer, capacity building and training programmes, [in order to enhance resilience to disasters and implement the framework/for the implementation of the framework] [by xx % by 2030].	<i>Substantially</i> enhance international cooperation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030
		[b] Enhance international cooperation to	

mobilize [a variety of necessary resources of its implementation of the framework particularly by developing] [adequate/effective] and sustainable support for the implementation of the framework particularly [by/in] developing countries. [FN] To achieve this target, minimum average international cooperation to developing countries for disaster risk reduction between 2020 and 2030 should be higher than average international cooperation between 2005 and 2015

[7] Early warning systems and risk assessments

[a] Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to the people by 2030.

[b] To develop specific multi-hazard early warning systems and to increase availability and access of people to information related to disaster risk.

NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI

Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:

<http://www.feem.it/getpage.aspx?id=73&sez=Publications&padre=20&tab=1>
http://papers.ssrn.com/sol3/JELJOUR_Results.cfm?form_name=journalbrowse&journal_id=266659
<http://ideas.repec.org/s/fem/femwpa.html>
<http://www.econis.eu/LNG=EN/FAM?PPN=505954494>
<http://ageconsearch.umn.edu/handle/35978>
<http://www.bepress.com/feem/>

NOTE DI LAVORO PUBLISHED IN 2015

ERM	1.2015	Elena Verdolini, Laura Diaz Anadon, Jiaqi Lu and Gregory F. Nemet: The Effects of Expert Selection, Elicitation Design, and R&D Assumptions on Experts' Estimates of the Future Costs of Photovoltaics
CCSD	2.2015	James Lennox and Ramiro Parrado: Capital-embodied Technologies in CGE Models
CCSD	3.2015	Claire Gavard and Djamel Kirat: Flexibility in the Market for International Carbon Credits and Price Dynamics Difference with European Allowances
CCSD	4.2015	Claire Gavard: Carbon Price and Wind Power Support in Denmark
CCSD	5.2015	Gunnar Luderer, Christoph Bertram, Katherine Calvin, Enrica De Cian and Elmar Kriegler: Implications of Weak Near-term Climate Policies on Long-term Mitigation Pathways
CCSD	6.2015	Francisco J. André and Luis M. de Castro: Incentives for Price Manipulation in Emission Permit Markets with Stackelberg Competition
CCSD	7.2015	C. Dionisio Pérez Blanco and Thomas Thaler: Water Flows in the Economy. An Input-output Framework to Assess Water Productivity in the Castile and León Region (Spain)
CCSD	8.2015	Carlos M. Gómez and C. Dionisio Pérez-Blanco: Simple Myths and Basic Maths about Greening Irrigation
CCSD	9.2015	Elorri Igos, Benedetto Rugani, Sameer Rege, Enrico Benetto, Laurent Drouet, Dan Zachary and Tom Haas: Integrated Environmental Assessment of Future Energy Scenarios Based on Economic Equilibrium Models
ERM	10.2015	Beatriz Martínez and Hipòlit Torrò: European Natural Gas Seasonal Effects on Futures Hedging
CCSD	11.2015	Inge van den Bijgaart: The Unilateral Implementation of a Sustainable Growth Path with Directed Technical Change
CCSD	12.2015	Emanuele Massetti, Robert Mendelsohn and Shun Chonabayashi: Using Degree Days to Value Farmland
CCSD	13.2015	Stergios Athanassoglou: Revisiting Worst-case DEA for Composite Indicators
CCSD	14.2015	Francesco Silvestri and Stefano Ghinoi : Municipal Waste Selection and Disposal: Evidences from Lombardy
CCSD	15.2015	Loïc Berger: The Impact of Ambiguity Prudence on Insurance and Prevention
CCSD	16.2015	Vladimir Otrachshenko and Francesco Bosello: Identifying the Link Between Coastal Tourism and Marine Ecosystems in the Baltic, North Sea, and Mediterranean Countries
ERM	17.2015	Charles F. Mason, Lucija A. Muehlenbachs and Sheila M. Olmstead: The Economics of Shale Gas Development
ERM	18.2015	Anna Alberini and Charles Towe: Information v. Energy Efficiency Incentives: Evidence from Residential Electricity Consumption in Maryland
CCSD	19.2015	ZhongXiang Zhang: Crossing the River by Feeling the Stones: The Case of Carbon Trading in China
CCSD	20.2015	Petterson Molina Vale: The Conservation versus Production Trade-off: Does Livestock Intensification Increase Deforestation? The Case of the Brazilian Amazon
CCSD	21.2015	Valentina Bosetti, Melanie Heugues and Alessandro Tavoni: Luring Others into Climate Action: Coalition Formation Games with Threshold and Spillover Effects
CCSD	22.2015	Francesco Bosello, Elisa Delpiazzo, and Fabio Eboli: Macro-economic Impact Assessment of Future Changes in European Marine Ecosystem Services
CCSD	23.2015	Maryse Labriet, Laurent Drouet, Marc Vielle, Richard Loulou, Amit Kanudia and Alain Haurie: Assessment of the Effectiveness of Global Climate Policies Using Coupled Bottom-up and Top-down Models
CCSD	24.2015	Wei Jin and ZhongXiang Zhang: On the Mechanism of International Technology Diffusion for Energy Technological Progress
CCSD	25.2015	Benjamin Michallet, Giuseppe Lucio Gaeta and François Facchini: Greening Up or Not? The Determinants Political Parties' Environmental Concern: An Empirical Analysis Based on European Data (1970-2008)
CCSD	26.2015	Daniel Bodansky, Seth Hoedl, Gilbert Metcalf and Robert Stavins: Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies Through a Future International Agreement
CCSD	27.2015	Giannis Vardas and Anastasios Xepapadeas: Time Scale Externalities and the Management of Renewable Resources
CCSD	28.2015	Todd D. Gerarden, Richard G. Newell, Robert N. Stavins and Robert C. Stowe: An Assessment of the Energy-Efficiency Gap and Its Implications for Climate Change Policy
CCSD	29.2015	Cristina Cattaneo and Emanuele Massetti: Migration and Climate Change in Rural Africa
ERM	30.2015	Simone Tagliapietra: The Future of Renewable Energy in the Mediterranean. Translating Potential into Reality
CCSD	31.2015	Jan Siegmeier, Linus Mattauch, Max Franks, David Klenert, Anselm Schultes and Ottmar Edenhofer: A Public Finance Perspective on Climate Policy: Six Interactions That May Enhance Welfare
CCSD	32.2015	Reyer Gerlagh, Inge van den Bijgaart, Hans Nijland and Thomas Michielsen: Fiscal Policy and CO2 Emissions of New Passenger Cars in the EU
CCSD	33.2015	Marie-Laure Nauleau, Louis-Gaëtan Giraudet and Philippe Quirion: Energy Efficiency Policy with Price-quality Discrimination

CCSD	34.2015	Eftichios S. Sartzetakis, Anastasios Xepapadeas and Athanasios Yannacopoulos: Regulating the Environmental Consequences of Preferences for Social Status within an Evolutionary Framework
CCSD	35.2015	Todd D. Gerarden, Richard G. Newell and Robert N. Stavins: Assessing the Energy-efficiency Gap
CCSD	36.2015	Lorenza Campagnolo and Fabio Eboli: Implications of the 2030 EU Resource Efficiency Target on Sustainable Development
CCSD	37.2015	Max Franks, Ottmar Edenhofer and Kai Lessmann: Why Finance Ministers Favor Carbon Taxes, Even if They Do not Take Climate Change into Account
CCSD	38.2015	ZhongXiang Zhang: Carbon Emissions Trading in China: The Evolution from Pilots to a Nationwide Scheme
CCSD	39.2015	David García-León: Weather and Income: Lessons from the Main European Regions
CCSD	40.2015	Jaroslav Mysiak and C. D. Pérez-Blanco: Partnerships for Affordable and Equitable Disaster Insurance
CCSD	41.2015	S. Surminski, J.C.J.H. Aerts, W.J.W. Botzen, P. Hudson, J. Mysiak and C. D. Pérez-Blanco: Reflections on the Current Debate on How to Link Flood Insurance and Disaster Risk Reduction in the European Union
CCSD	42.2015	Erin Baker, Olaitan Olaleye and Lara Aleluia Reis: Decision Frameworks and the Investment in R&D
CCSD	43.2015	C. D. Pérez-Blanco and C. M. Gómez: Revealing the Willingness to Pay for Income Insurance in Agriculture
CCSD	44.2015	Banchongsan Charoensook: On the Interaction between Player Heterogeneity and Partner Heterogeneity in Two-way Flow Strict Nash Networks
CCSD	45.2015	Erin Baker, Valentina Bosetti, Laura Diaz Anadon, Max Henrion and Lara Aleluia Reis: Future Costs of Key Low-Carbon Energy Technologies: Harmonization and Aggregation of Energy Technology Expert Elicitation Data
CCSD	46.2015	Sushanta Kumar Mahapatra and Keshab Chandra Ratha: Sovereign States and Surging Water: Brahmaputra River between China and India
CCSD	47.2015	Thomas Longden: CO₂ Intensity and the Importance of Country Level Differences: An Analysis of the Relationship Between per Capita Emissions and Population Density
CCSD	48.2015	Jussi Lintunen and Olli-Pekka Kuusela: Optimal Management of Markets for Bankable Emission Permits
CCSD	49.2015	Johannes Emmerling: Uncertainty and Natural Resources - Prudence Facing Doomsday
ERM	50.2015	Manfred Hafner and Simone Tagliapietra: Turkish Stream: What Strategy for Europe?
ERM	51.2015	Thomas Sattich, Inga Ydersbond and Daniel Scholten: Can EU's Decarbonisation Agenda Break the State-Company Axis in the Power Sector?
ERM	52.2015	Alessandro Cologni, Elisa Scarpa and Francesco Giuseppe Sitzia: Big Fish: Oil Markets and Speculation
CCSD	53.2015	Joosung Lee: Multilateral Bargaining in Networks: On the Prevalence of Inefficiencies
CCSD	54.2015	P. Jean-Jacques Herings: Equilibrium and Matching under Price Controls
CCSD	55.2015	Nicole Tabasso: Diffusion of Multiple Information: On Information Resilience and the Power of Segregation
CCSD	56.2015	Diego Cerdeiro, Marcin Dziubinski and Sanjeev Goyal: Contagion Risk and Network Design
CCSD	57.2015	Yann Rébillé and Lionel Richefort: Networks of Many Public Goods with Non-Linear Best Replies
CCSD	58.2015	Achim Hagen and Klaus Eisenack: International Environmental Agreements with Asymmetric Countries: Climate Clubs vs. Global Cooperation
CCSD	59.2015	Ana Mauleon, Nils Roehl and Vincent Vannetelbosch: Constitutions and Social Networks
CCSD	60.2015	Adam N. Walker, Hans-Peter Weikard and Andries Richter: The Rise and Fall of the Great Fish Pact under Endogenous Risk of Stock Collapse
CCSD	61.2015	Fabio Grazi and Henri Waisman: Agglomeration, Urban Growth and Infrastructure in Global Climate Policy: A Dynamic CGE Approach
CCSD	62.2015	Elorri Igos, Benedetto Rugani, Sameer Rege, Enrico Benetto, Laurent Drouet and Dan Zachary: Combination of Equilibrium Models and Hybrid Life Cycle-Input-Output Analysis to Predict the Environmental Impacts of Energy Policy Scenarios
CCSD	63.2015	Delavane B. Diaz: Estimating Global Damages from Sea Level Rise with the Coastal Impact and Adaptation Model (CIAM)
CCSD	64.2015	Delavane B. Diaz: Integrated Assessment of Climate Catastrophes with Endogenous Uncertainty: Does the Risk of Ice Sheet Collapse Justify Precautionary Mitigation?
CCSD	65.2015	Jan Witajewski-Baltvilks, Elena Verdolini and Massimo Tavoni: Bending The Learning Curve
CCSD	66.2015	W. A. Brock and A. Xepapadeas: Modeling Coupled Climate, Ecosystems, and Economic Systems
CCSD	67.2015	Ricardo Nieva: The Coalitional Nash Bargaining Solution with Simultaneous Payoff Demands
CCSD	68.2015	Olivier Durand-Lasserve, Lorenza Campagnolo, Jean Chateau and Rob Dellink: Modelling of Distributional Impacts of Energy Subsidy Reforms: an Illustration with Indonesia
CCSD	69.2015	Simon Levin and Anastasios Xepapadeas: Transboundary Capital and Pollution Flows and the Emergence of Regional Inequalities
CCSD	70.2015	Jaroslav Mysiak, Swenja Surminski, Annegret Thieken, Reinhard Mechler and Jeroen Aerts: Sendai Framework for Disaster Risk Reduction – Success or Warning Sign for Paris?