ISSN 0798 1015

REVISTA ESPACIOS

HOME Revista ESPACIOS ÍNDICES A LOS AUTORES

Vol. 38 (Nº 07) Año 2017. Pág. 19

COP21: outcomes and framework analysis

COP21: Resultados y análisis

Geanderson E. AMBRÓSIO 1; Fabiana R. COUTO-SANTOS 2; Dênis A. CUNHA 3

Recibido: 28/08/16 • Aprobado: 20/09/2016

Content

ABSTRACT:
The recognition that current global mitigation acts will not guarantee global warming under 2ºC in 2100 have posited especial attention over the Conference of the Parties in Paris, 2015 (COP21). The outcomes of COP21 stablished a new paradigm by bringing equity and capability to the context of CBDR, which recognises that burden sharing of mitigation, interacts directly with human development. In addition, COP21 announced a USD 100 billion dollars of financial credit and recognised 1.5ºC as a feasible target for maximum global warming. The final agreement transmits a clear message and we evaluated its applicability from international towards intranational territory.
Key words: Conference of Parties, COP21, Common but Differentiated Responsibilities, Sustainable Development, Mitigation.

RESUMEN:
El reconocimiento de que medidas mundiales de mitigación no garantizan bajar el calentamiento global 2 º c en 2100, que pusieron atención especial sobre ello en la Conferencia en París, 2015 (COP21). Los resultados de la COP21 establecieron un nuevo paradigma incorporando capital y capacidad para el contexto de CBDR, que reconoce reparto de mitigación, interactuando directamente con el desarrollo humano. Además, COP21 anunció un crédito financiero de USD 100 billones y había reconocido 1.5ºC como un objetivo factible de aumento del calentamiento. El acuerdo final transmite un mensaje claro y se evaluó su aplicabilidad internacional hacia el territorio interno de los países.
Palabras clave: Conferencia de las partes, COP21, responsabilidades comunes pero diferenciadas, desarrollo sostenible, mitigación.

1. Introduction

In the history of humankind, there are some examples of sudden and huge threats so dire in their consequences that they have engaged all nations in risk mitigation (McNutt 2015). However, climate change is a slowly scaling and long-enduring global threat and its characteristics have made nations to postpone their engagement into stopping global warming (McNutt 2015). Keeping the current paths of GHG emissions will result in 100% probability of

increased global average temperature in at least 2ºC in 2100 (Clarke et al 2014). Specific countries, such as South Africa, may experience a 4ºC warming in 2100 and more extreme heating days (Wright, Norval and Albers 2015). In addition, small island developing states would be at an even more particularly vulnerable position due to the effects of climate change over the rise of the sea levels (UN 2015a).

Since early 70's, issues such as climate change, ozone layer depletion and biological diversity loss have resulted in a growing international awareness about the environmental problems facing the planet (French 2000; Godoy 2010). In 1997, during the Conference of the Parties (COP), the Kyoto Protocol was stablished as the main regulatory framework to mitigate GHG emissions internationally. The Protocol was designed under the principle of Common but Differentiated Responsibilities (CBDR), which denotes the conscience of the public characteristic of externalities resulting from environmental degradation. In addition, CBDR assigns the historical guilt of the current environmental degradation to the developed societies, as well as its current capacity to deal with these problems. Although well defined in its conception, the outcomes of the Protocol negotiations among countries have been more as an adversarial rather than a cooperative exercise to address climate change. Each nation has been pursuing its own development agenda in their political, social, economic and environmental contexts (Hourcade and Shukla 2015). Many times, this context set developing and developed countries in opposite sides, mainly in addressing current vulnerability and adaptative measures, future climate change and mitigative measures, and even in the definition of the global environmental agenda.

After 2012, there was a feeling of urgency for a new paradigm of sustainable development, mitigation and burden sharing (Hourcade and Shukla 2015). This raised great pressure over COP21, held in Paris, in December 2015. The meeting has come with at least three major issues (UN 2015b): a) how to articulate long-term idea that socioeconomic opportunities created by the transition to a sustainable development will enable a world without poverty and hunger; b) that COP21 has to be a turning point and has to send the signal that the global transformation to sustainable economy is already underway and is beneficial; c) that to make it real, the approach has to be immediate, concrete and cooperative.

COP21 outcomes presented many statements aiming to deal with those issues. The encounter stated financing policies from developed to developing countries and enhanced the potential of the Intended Nationally Determined Contributions (INDC) to overcome the obligatory mitigations targets previously established by Kyoto Protocol. Furthermore, it strengthened the new paradigms of Equity and Common but Differentiated Responsibilities and Respective Capabilities as a theoretical perspective to overcome the frayed CBDR Principle. These outcomes directly affect the understanding of the main global environmental issues from developing and developed countries perspective. This paper aims to discuss the different demands for new paradigms and their possible consequences in mitigation of climate change, from globally to country specific and from theoretical to practice perspective.

---

2. Mitigative framework from international to intra-national context

2.1 The Principle of Common but Differentiated Responsibilities

The final text of the Rio Declaration, defined in the 1992 United Nations Conference on Environment and Development (UNCED), consisted in 27 operational principles to guide countries to face climate threat. The 6th and 7th principles introduced the CBDR, a foundation for mitigation widely disseminated in the world that has received an increasing recognition also in international law (Stone 2004). According to CBDR principle, a special priority shall be given to the needs of developing countries, particularly to the least developed and those most environmentally vulnerable. In addition, the developed countries recognise the responsibility

that they bear in the international pursuit of sustainable development in view of the pressures their societies have been placing on the global environment and of their technologies and financial resources (Declaração do Rio De Janeiro 1992).

The term 'common responsibilities' denotes the conscience of the public characteristic of externalities resulting from environmental degradation. It suggests that certain risks affect and are affected by all the nations on earth. These risks include not only the climate and the ozone layer, but also all global public goods including, for example, peace, public health and terrorism (Stone 2004). We abstract from this term the intention of nations to seek jointly the development to meet the needs of the present generation without compromising the ability to meet the needs of future generations. The differentiation of these responsibilities is mainly due to two reasons: the historical guilt of the developed societies over the current environmental degradation, as well as its current capacity to deal with these problems (French 2000). All nations must cooperate in a spirit of global partnership to reduce environmental risks, but the responsibilities must be 'differentiated', considering that not all countries should contribute in the same way (Stone 2004). The pattern of development historically based on the environmental exploitation places the northern countries as the most responsible and most able to glimpse environmentally sustainable solutions, while developing countries are generally less scientifically developed and most vulnerable to climate threat (Brooks, Adger and Kelly 2005).

The path of development that current developed countries have done before should be possible for the presently developing countries if they choose to do so. In fact, the achievement of high standards of living and environmental sustainability are equally important objectives, but they must be specified in a way that the latter does not impose limitations to the first, by the developing countries. Political and local economic interests surround the environmental agreements and influence the decisions of their participants, consequently moving them away from the fundamental concern of sustainable development. The adoption of the CBDR principle intend to minimise these possible negative effects, especially concerning the share of each countries' mitigation burdens (Wittneben 2007).

2.2 GHG emission thresholds

In 1997, COP 3 took place and had as its principal product the formulation of the Kyoto Protocol. The Protocol stipulated that the entitled Annex I countries should reduce their combined GHG emissions by 5.2% CO2eq between 2000 and 2012 compared to 1990 levels (UN 1998). However, the Protocol would enter into force only if ratified by 55 countries included in Annex I, which accounted for at least 55% of CO2eq emissions of 1990. Considering the three largest emitters, India, China and USA, the two first are not classified as Annex I countries and, according to the Protocol and CBDR, did not have the obligation to contribute to mitigations. Contrariwise, United States, which is an Annex I country, refused to ratify the Protocol, claiming that it would work against its economic goals. In 2005, even without the signature by the United States, the Protocol entered into force in the framework of international law.

In 2009, on the eve of the COP 15 took place in Copenhagen, Brazil announced its voluntary targets for reducing GHG emissions based in the National Policy on Climate Change (NPCC) (Brasil 2013). This policy opened precedent for other developing countries to take voluntary reduction targets, in line with the statement that everyone can contribute to avoid global warming. Even during the COP 15, United States, China, India, South Africa and Brazil signed an international agreement recognising the scientific finding that, to avoid irreversible environmental damage, the rise in global temperatures should not exceed 2ºC above pre-industrial levels (Heitzig, Lessmann and Zou 2011). Because of the Copenhagen agreement, the 2ºC goal to maintain a particular level of global warming became a new paradigm to the establishment of mitigation targets.

From 2008 to the current days, a succession of failures were essential to raise the pressure

over new paradigms of global environmental change. The Financial Crisis in 2008 initiated a period when less attention was focused over climate threat (Hourcade and Shukla 2015). Actually, governments encouraged production and consumption as a response to the recession. By the year of 2012, the commitments assigned in the Kyoto Protocol have not been accomplished. In the same year, at COP 18, global leaders had to extend the targets and the time, to 18% below 1990 year-based until 2020. In 2013, the IPCC AR5 assured that the previous efforts to slow down global warming have been not sufficient to keep the temperature below 2ºC by 2100. There were an eminent requirement for more mitigation, which enhanced again the discussion about responsibilities of mitigation. All these issues exposed some weakness of the current methods and frameworks for mitigation and the design of a new paradigm had to pass through the understanding of the failures of the current ones.

2.3 The misapplications of CBDR regarding GHG emissions thresholds

Several authors (French 2000; Stone 2004; Heitzig, Lessmann and Zou 2011) point out economic, political and agents' rationality reasons that may have contributed to the non-achievement of the Kyoto Protocol targets, as well as inconsistencies within the own CBDR principle. The drivers in the economic and politics fields are intrinsically linked. The positioning of European countries has been in favor of the agreement since the Kyoto Protocol discussions started, and some environmental likely production methods had already been implanted even before the Protocol have entered into force. Developing countries, in turn, have always been in favor of the agreement with reduction targets only for Annex I countries, and encouraged funding and technology transfer in line with the foundation of corrective justice. The United States claimed that if it had to fit the standards stipulated by the Protocol, its economic growth would be impaired due to the high cost of upgrading its production and energy matrix. Thus, it points a conflictive position among countries.

The law, microeconomics and game theory may point out the flaws in the current balance of the reductions allocation system. In general, a dilution of regulatory requirements for developing countries is likely to impede the progress of these countries towards environmental adaptation place. Developing countries may prefer to ensure intensive emissions structures if these are the best to achieve development, without concerning about climate change. In the current international framework, emission thresholds are not determined by the sake of economic efficiency, but by the corrective justice according to the differentiated responsibilities (Stone 2004). In this sense, developed countries should reduce emissions as a compensation for GHGs released previously, and developing countries may develop based in intensive emissions activities, if they choose so.

Anyway, the last decades demonstrated that the establishment of mitigation targets is a much more complex matter than a mathematical one, because there is a free riding behavior that is not always easily accepted by all the agents involved. Stone (2004) hypothesised two countries: the developed and the developing, both facing the risks of climate change. The author assumed that for a developing country, with the lowest level of wealth, to reduce environmental risk is a lower priority goal compared to other items on its agenda. If each country act solely in its own interests, the result would be that, the developed country would pay the entire mutually desired cost of risk reduction. The amount of environmental protection acquired by developing countries for their own benefit would be funded solely by developed country, with the developing country acting as a free rider on the surplus produced by the developed one. That occurs due to the public good feature that environmental goods present. This emphasises the relevance of intergovernmental negotiation when implementing one unique rule for diverse countries and its importance to achieve international goals (Heitzig, Lessmann and Zou 2011).

This logic emphasises that developing countries generally prefer to reduce impacts of current

climate change by applying adaptative measures, then to reduce future climate change by mitigation measures. More specifically, the lowest developed countries will not even care about sustainability if they are unable to provide for their own basic needs and that is why to choose adaptations instead of mitigation. In this sense, governments of developing countries have to deal with external pressure from developed ones to mitigate and internal pressure to take adaptative measures. Although both side pressures, the central planner of the country is the one who determine the objective to follow. Strategies that result in free riding in international context may not occur in this case. Actually, those strategies are not fundamentally effective, or necessary, for internal mitigation because of the country's national sovereignty. Therefore, internally to the countries, the government may impose mitigation and/or adaptation goals and the mechanisms to achieve it.

2.4 Abstractions to the intra-national level

International cooperation is a key factor in order to fulfill mitigation goals (French 2000) suggesting that commitments are undertaken not only by developed countries but also for the developing ones (IPCC 2007b, 2014). Governments of countries such as Brazil, China and India, have been examining the costs and benefits of developing with low GHG emission rates. The reason to do that is not only an altruistic spirit, but also the expectation that current mitigation measures can reduce future expenses in adaptation (ESMAP and GFC, 2009). These surveys aim alternative socioeconomic development through lower consumption of natural resources and lower environmental degradation, concomitant with poverty and inequality reductions (Wlokas et al 2012).

The group of actions that enable potential adaptation to mitigation acts, and vice-versa, are a relatively new approach for sustainable development entitled Low Carbon Development. This concept means that the GHG emissions should not be a side effect of human development; actually, as negative externalities, the beneficiaries or the environmental damage causative agent should minimise and internalise undesirable effects. Wlokas et al (2012) state that the Low Carbon development is only feasible if it conciliates potential to reduce poverty and pollution, which intertwine the CBDR principle. It argues that to operate a just transition of developing countries to high standards of living, these countries should not be limited in its CO2 emissions until they become developed, and this must not compromise the current global climate targets.

To operationalise this theoretical proposal in an intra-national level we consider some contextual punctualities. The Kyoto Protocol regulatory instrument carries a legal power only on a signatory group of countries at the national level (the Annex I), but the benefits of avoiding environmental damage is a global public good. As an example of the Brazilian case, the NPCC determines the national emission reduction guidelines and exercise legal power over the nation, states and municipalities. It means that NPCC acts legally on making municipalities and states to became, at the same time, mitigative actors and beneficiaries of the public goods derived. Therefore, the federal government improves the implementation of mitigation actions through the NPCC principles as they apply to all administrative political spheres. The NPCC encourages the introduction of regional regulations, which pay attention to the peculiarities that NPCC as a federal regulatory do not account for. In 2014, nineteen states and the Distrito Federal took advantage of laws or law projects that regulates the reduction of GHG emissions (Fórum Clima 2014). On the other hand, in a worldwide level, the COP, responsible for the introduction of the Kyoto Protocol, have no similar authority among GHG mitigators and beneficiaries, since the instruments of international law do not override national sovereignty.

In domestic emissions markets, a central authority may set emissions thresholds which compliance is legally imposed, but both measures are more difficult in major international markets (Victor 2010). In accordance with these statements, the reductions allocation proposition from sequential games suggested by Heitzig, Lessmann and Zou (2011) is not

necessarily the best option for local markets, since the hierarchical judicial instrument may enforce mitigation objectives. By one side, the CBDR principle settled for international level as a theoretical foundation for reductions, have many specificities to be applied at intra-national level and may not be the best option. On the other side, the international run-out of the principle may still not be true within intra-national level if we ponder these specificities before applying it. Factors such as the interest of the federal government and the judicial hierarchy established within nations suggest the applicability of this theoretical framework to improve environmental and human development solutions at the same time. Thus, the intra-national measures of control are able to strengthen the theoretical propositions originally formulated to the international community worldwide. In the whole context, the decisions, and its consequences, made by COP21 have to be evaluated considering all the points previously raised.

---

3. COP21

3.1 Pressure and expectations

The experience of Kyoto is the one that we should not forget. Forcing countries to commit to long-term mitigation targets brings the negotiation process down to a 'blame game' with the risks of dissembling over-commitments accepted formally around the negotiating table but never really enforced for fear of excessive costs (Hourcade and Ghersi, 2002). Although, there are other reasons that have led to the urgency for a new mitigation paradigm. Fundamental questions such as how to establish long-term mitigation targets beyond 2020 and how to enforce the CBDR and respective capabilities principle have risen and have been pressuring decision makers (Ji and Sha 2015).

The Informal Working Lunch on Climate Change, released before COP21, intended to 'reach a shared political understanding of the transformational, long term implications of a new climate change agreement' (UN 2015b). According to the document, there were three major overhanging political messages emerging. At first, the new long-term agreement must be comprehensive, ridding the world of poverty through social and economic opportunities created by the new mitigation paradigm. This goal is equally supported by the United Nations itself, as we see in the 2030 Agenda for Sustainable development (UN 2015c), and by the scientific community. Daly and Furlay (2004) stated that the welfare of the poor should first promoted, because they will not care about sustainability until they are able to provide for their own basic needs. Wlokas et al. (2012) argued that a low carbon development is only feasible if there is a potential to join mitigation actions with poverty alleviation. These statements are strengthened by the conclusion developed at Our Common Future Under Climate Change Conference that 'ambitious mitigation to limit warming to less than 2°C above preindustrial levels is economically feasible' (Field 2015:2).

Secondly, the Paris agreement must send a loud signal to the agents that the transformation in the global economy is inevitable, beneficial, and already underway. This transformation has been in course since the initial meetings about climate change in early 70's; however, recent researchers have found that the current speed of the change is insufficient to reach the 2ºC as expected (IPCC 2013). This finding states against the interest that especially small islands have to limit the warming under 1.5ºC to prevent the threat of rising sea levels. To enable the achievement of any of these goals, the agreement must articulate the means - finance, technology and capacity building - and call for an immediate, concrete and cooperative action. More specifically, the finance must mobilise at least $100 billion per year by 2020 and further cooperation on technologies. The developed countries may lead the financing and demonstrate the feasibility of a low-carbon development path, this leads to path replication and dependence by the developing ones (Ji and Sha, 2015). The proposed leadership intends to elevate the financing beyond loans at low interest rates, but in order to lead by the example and the historical culpability.

Taking the theoretical side for analysis, the expectations before COP21 were in redesign the CBDR principle or even introducing a completely new paradigm. The discussion about how much each country may mitigate has been under discussion for almost 20 years, but consensus was not achieved yet. The fair distribution of mitigation challenges involves human values rather than just scientific facts (Peters et al 2015) and some proposals have already emerged. Bohringer and Welsch (2006) stated that gradual convergence from sovereignty towards egalitarianism could provide a pragmatic solution to the equity debate. On the other side, Costa, Rybski and Kropp (2011) developed an emission-reducing framework that considers human development to determinate the mitigation goals. Between the first (more prognostic) approach and the second (more human valuable) many theories may rely, enhancing discussion and making the way to the consensus even more complex.

3.2 Outcomes and impacts

Time is running out while actions are not leading us to reach our own goals and so, the time for just debating has already ended (McNutt 2015). The Paris agreement signed at the final day of COP21 was historic, comparable to the importance that Kyoto Protocol have had at its time (Rogers 2015). There was pressure over the possible COP21 outcomes and now an optimist relief may take place. In fact, at least three pivotal decision were taken regarding, mitigation targets, financing and responsibility sharing.

For the very first time, the parties have recognised that targeting a 1.5º warming in 2100 is feasible and more prudent, especially regarding the small islands and the very poor countries. At the same time, much greater efforts will be required to achieve this new possible target. The parties already know that the INDCs contributions itself will not be able to achieve even the 2ºC expected. To take this new challenge to practice, the parties invited the IPCC to provide a special report in 2018 discussing the impacts of the 1.5ºC global warming. In this topic, international community have taken an important step but, for now, it triggered more doubts than certainties. Once the time for action have already passed, scientific research will have a crucial role in providing new information about where and how to achieve the goal.

Relating to finance, developed countries agreed to rise an amount of USD 100 billion, per year, to enhance the implementation of mitigation and adaptation in developing countries. Besides, prior to 2025, the parties shall set a new collective value from a floor of USD 100 billion, per year, taking in account the urgencies of developing countries. The decision reflects the importance of adequate and predictable financial resources, which may guarantee the inclusion of developing into the avoidance of climate change process. However, the text does not imply any practical action about how to rise the amount or how to loan to the beneficiaries. Actually, it regards the Standing Committee on Finance and other institutions to enhance coordination and delivery of resources.

In the theoretical field, the Paris Agreement recognised that the pursuit of its objectives should be guided by the principle of equity CBDR and respective capabilities. In practice, it reinforce the fundamental priority of safeguarding human development and food security. It posits the fundamental role of adaptation to maintain productivity, especially in the agricultural sector. Although for some decades the principle of CBDR had been run-out, the parties seems to recognise that its misapprehension was in the imposed targets rather than in the principle conception. This may have led to the adoption of the INDCs along the last years over the gradual deterioration of the Kyoto Protocol targets. On the other side, the parties have already recognised that INDCs itself will not work out solely, and so, other proposals and methodologies are still required. Henceforth, the role of scientific research integrating environmental, socioeconomic and political fields is even more important, because one of the core methodological issues remain unclosed.

Besides these main outcomes, COP21 have enhanced and recognised efforts of the parties over adaptation. It established a mechanism to evaluate risk transfer, to host database and

information and to provide insurance in order to facilitate risk management. These recognition approximate adaptative measures to the mitigation ones, which have been well discussed in the context of the COPs. In addition, COP has decided to strengthen technology research, development and demonstration, as well as endogenous capacity for its development. This intend to build capacity for developing countries to deal with unexpected climate events and make them more autonomous. Finally, the document provides for the transparency, to strengthen institutions and activities, making them more trackable and replicable. This includes repassing information on the most up to date of GHG inventory reports, avoiding duplication among existent bodies and double counting among gases and sectors.

4. Conclusions

COP21 was held under much pressure because of continuous previous failure of many mechanisms and theories regarding, when, how and where to mitigate. The whole context conjectured much expectation over the meeting outcomes, but this may not be translated into false optimism about the future effects of the outcomes. The world freedom from poverty, for example, is still a consequence of much more efforts than the COP is able to make alone. Actually, what is relevant is that providing mitigation without adaptation, especially for the least fortunate, is one more way to enlarge the gap between the world we live and the world without poverty. By ratifying financial support for developing countries and taking the requests of small islands and poorer countries about 1.5ºC target, the parties are contributing to both human and environmental demands.

The Conference has sent a loud and clear signal to the world population. Compared to the previous documents of the parties meetings, COP21 is a way more objective and promising. To take the 1.5ºC as a feasible objective is an audacious but necessary act. Once scientific community is not sure about all the effects of global warming, based on the precautionary principle, it is prudent to take the more parsimonious target once it is the more likely to have less effect on human kind and on environment itself. However, to know if COP21 could be a turning point is a question that is too early to answer. As well as Kyoto Protocol had an enormous acclaim at its time, and its targets were not achieved, the COP21 final agreement will have to wait several years to be understood as a sudden delight or a turning point.

Although the approach and concern about climate change have been taking since early 70’s, several years ago we knew that our efforts would not be able to keep earth under 2ºC warming in 2100. Therefore, the question is no more the immediatism of actions, once we know we are late, but the efficiency of it. To be efficient, pro-climate actions have to be concrete and cooperative. The new financing announcement may enable this concreteness making developing countries more able to act by themselves, which may also enable them to consider local heterogeneity and act towards climate and social development. The new paradigm of the principle of equity and CBDR and respective capabilities is a way more inclusive than the older one. It considers the equality of access and the capacity to act into account, i.e., developing countries are not in the same baseline as developed ones, and so, may not act like them. This makes the science of defining targets even harder, because now there is a more robust theoretical foundation to justify the differences among countries, societies, cultures and economies.

In general, COP21 stated more challenges than answers, but this may not be viewed in a negative way. The answers regarded to the CBDR principle, which were run-out but did not needed a complete rethinking. In fact, it still rules, especially inside countries, but its new concepts of equity and capability may be able to renew it again for the whole world. The theoretical challenge regard to the applicability of this new concept, which has been though from some years ago but has been barely operationally applied. The main challenge posited by COP21 is the new global warming target, which would have been stated several years ago. To deal with a target of 1.5ºC is a primary necessity and should have been considered from the moment it was realised the great variability of global warming probabilities, given certain

emissions. The complexity of all these statements makes it difficult to provide a timeless and spaceless conclusion regarding COP21 outcomes. In fact, we already know that the time to act is now and the decisions made ate COP21 came to help to realise where and how the changes will be made.

References

Bohringer C and Welsch H. 2006. 'Burden sharing in a greenhouse: egalitarianism and sovereignty reconciled' *Journal of Applied Economics*, 3: 8981-96.

Brasil. 2013. Comitê Interministerial Sobre Mudança do Clima. *Plano Nacional sobre Mudança do Clima*, Brasília, DF, Brazil.

Brooks, Adger and Kelly. 2005. 'The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation' *Global Environmental Change* 15(2): 151-63.

Clarke L, Jiang K, Akimoto K, Babiker M, Blanford G, Fisher-Vanden K, Hourcade J-C, Krey V, Kriegler E, Löschel A, McCollum D, Paltsev S, Rose S, Shukla P R, Tavoni M, van der Zwaan B C C and van Vuuren D P. 2014. 'Assessing Transformation Pathways In: Climate Change 2014: Mitigation of Climate Change' *Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Costa L, Rybski D and Kropp J. 2011. A Human Development Framework for CO2 Reductions. *PLoS ONE* 6(12): 1-9.

Daly H and Furlay J. 2004. *Ecological economics: principles and applications*. Washington: Island Press.

Declaração do Rio De Janeiro. 1992. *Estudos Avançados* 6(15): 153-9.

ESMAP (Energy Sector Management Assistance Program) and CFAP (Carbon Finance Assist Program). 2009. 'Low Carbon Growth Country Studies - Getting Started: Experience from Six Countries' *Low Carbon Growth Country Studies Program - Mitigating Climate Change through Development*, Washington, DC, EUA.

French D. 2000. 'Developing States and International Environmental Law: The Importance of Differentiated Responsibilities' *International and Comparative Law Quarterly*, 49(1): 35-60.

Godoy S. 2010. *O Protocolo de Kyoto e os países em desenvolvimento: uma avaliação da utilização do Mecanismo de Desenvolvimento Limpo*. PhD Thesis, Universidade de São Paulo, São Paulo, Brazil.

Heitzig, Lessmann and Zou. 2011. 'Self-enforcing strategies to deter free-riding in the climate change mitigation game and other repeated public good games' *Proceedings of the National Academy of Sciences* 108(38): 15739-44.

Hourcade J and Ghersi F. 2002. *The economics of a lost deal: Kyoto-The Hague-Marrakesh*. *The Energy Journal*, 23: 1-26.

Hourcade J and Shukla P. 2015. 'Cancun's paradigm shift and COP21: to go beyond rhetoric' *International Environmental Agreements: Politics, Law and Economics*, 15(4): 343-51.

Ji Z and Sha F. 2015. 'The challenges of the post-COP21 regime: interpreting CBDR in the INDC context' *International Environmental Agreements: Politics, Law and Economics*, 15(4): 421-30.

IPCC (Intergovernmental Panel on Climate Change). 2014. 'Climate Change 2014: Mitigation of Climate Change' *Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge

University Press, Cambridge, United Kingdom and New York, NY, USA.

McNutt, M. 2015. 'The beyond-two-degree inferno' *Science*, 349(6243): 7.

Fórum Clima. 2014. 'Balanço de Ações 2014' *Fórum Clima – Ação Empresarial sobre as Mudanças Climáticas*, São Paulo, Brazil.

Field C. 2015. 'Science Offers Robust Foundations for Ambitious Outcomes at COP21 and Beyond.' *In Our Common Future Under Climate Change 2015*. Paris, France.

Peters G, Andrew R, Solomon S and Friedlingstein P. 2015. 'Measuring a fair and ambitious climate agreement using cumulative emissions' *Environmental Research Letters* 10: 1-9.

Rogers S. 2015. 'COP21: un succès à confirmer' *Le Monde*, 25 December.

Stone C. 2004. 'Common but Differentiated Responsibilities in International Law' *The American Journal of International Law*, 98(2): 276-301.

UN (United Nations). 1998. 'Kyoto protocol to the United Nations framework convention on climate change' *United Nations Framework Convention on Climate Change*, Kyoto, Japan.

UN. 2015a. 'Adoption of the Paris Agreement' *United Nations Framework Convention on Climate Change: Conference of the Parties 2015*, Paris, France.

UN. 2015b. Informal Working Lunch on Climate Change: Conclusions of the Chairs.

UN. 2015c. Transforming our World: The 2030 Agenda for Sustainable Development United Nations.

Victor D. 2010. 'Post-Kyoto International Climate Policy: Implementing Architectures

for Agreement' (eds. ALDY, J. E.; STAVINS, R. N.) Cambridge University Press, Cambridge, United Kingdom.

Wittneben B. 2007. 'The clean development mechanism: institutionalizing new power relations' *Working paper - Report series research in management*, The Netherlands.

Wlokas H, Rennkamp B, Torres M, Winkler H, Boyd A, Tyler E and Fedorsky C. 2012. 'Low Carbon Development & Poverty: Exploring poverty alleviating mitigation action in developing countries' *Working Paper - Mitigation Action Plans & Scenarios* 6, South Africa.

Wright C, Norval M and Albers P. 2015. 'Climate change, public health and COP21 – a South African Perspective' *South African Medical Journal*, 105(12): 997-8.

---

1. Corresponding author. Universidade Federal de Viçosa, Departamento de Economia Rural. Avenida Peter Henry Rolfs, s/n, Campus Universitário Viçosa, Instituto de Políticas Públicas e Desenvolvimento Sustentável – IPPDS – E-mail: geanderson.ambrosio@ufv.br

2. Universidade Federal de Viçosa, Departamento de Economia Rural. Avenida Peter Henry Rolfs, s/n, Campus Universitário Viçosa, Instituto de Políticas Públicas e Desenvolvimento Sustentável – IPPDS – E-mail: fabiana.couto@ufv.br or couto.santos@gmail.com

3. Universidade Federal de Viçosa, Departamento de Economia Rural. Avenida Peter Henry Rolfs, s/n, Campus Universitário Viçosa, Edifício Edson Potsch Magalhães. Viçosa, Minas Gerais, Brazil. E-mail: denis.cunha@ufv.br

---

Revista ESPACIOS. ISSN 0798 1015
Vol. 38 (Nº 07) Año 2017

[Índice]

[En caso de encontrar algún error en este website favor enviar email a webmaster]

©2017. revistaESPACIOS.com • Derechos Reservados