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# 二氧化碳减排责任分配研究

# Study on the Responsibility of Reducing CO2 emission

## 郑堃

指导教师：彭本荣

专业名称：海洋事务

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# 摘　要

全球气候变化引起的海平面上升、海表水温升高、海洋酸化、极端气候事件等不仅对脆弱的海洋与海岸带地区的生态环境产生重大的影响，而且直接威胁到人类的生存和发展。国际社会达成了将工业革命以来到本世纪末的增温控制在2 ℃以内的共识。但是世界各国经济发展程度存在差别且受气候变化的影响不一，实行碳减排的经济基础和发展低碳经济的动机也不尽相同，发达国家集团坚持可行性，反对分配正义与矫正正义，而发展中国家则坚持公平平等有差别原则。因此发达国家与发展中国家在$CO_2$ 减排责任分配问题上始终无法达成一致的意见。本研究旨在建立兼容发达国家与发展中国家的利益述求，既考虑到发达国家的效率原则，又满足发展中国家平等主义原则的$CO_2$ 减排责任分配模型，为国际$CO_2$ 减排谈判提供科学的、可行的依据。论文取得研究成果如下。

1）论文在分析国际气候变化谈判中各种道德伦理以及不同国家利益诉求的基础上，提出在$CO_2$ 减排责任分配中应该遵循基于效率的权利平等理论。该理论体现了不同国家的道德伦理原则，能够兼容发达国家与发展中国家的利益，还考虑世界面临的发展经济和减少贫困的挑战，即提高$CO_2$ 容量资源的利用效率；

2）论文基于提出的理论，建立了兼顾公平与效率的$CO_2$ 减排责任分配模型。本模型建立在权利平等的基础上，即基本权利绝对平等（各国每个人拥有相等的基本排放量）、非基本权利比例平等（各国非基本排放量分配与其对世界经济发展的贡献成正比）。由于非基本排放量的分配与各国对世界经济发展的贡献成正比，所以模型又体现了效率原则；

3）论文利用建立的模型估算了世界最大20 个排放国2005-2050 年最大可允许排放量。20 国中，发达国家可允许排放量逐年降低，发展中国家可允许排放量呈现出先上升后下降的趋势，到2020 年左右达到峰值。巴西、印度、印度尼西亚等部分发展中国家，由于目前排放量较可分配的基本排放量小，因此无需减排。这一结果与发展中国家和发达国家的诉求基本一致；

4）论文估算了世界最大20 个排放国2005-2050 年的减排责任。发展中国家（以中国为代表）未来每年的二氧化碳减排量先呈现减少的趋势，之后减排责任再随着时间的增加而递增；发达国家（以美国为代表）未来每年的二氧化碳减排量则表现为减排责任的逐年递增，但递增的弧度在逐渐变小，达到一定年限后，二氧化碳排放量趋于一个稳定平衡值；发达国家与发展中国家的人均二氧化碳排放量将趋于一个较为接近的稳定值，达到国际上所说的人均二氧化碳排放量趋同。一方面这给了发展中国家更多的发展机会，满足发展中国家发展权利的诉求，同时发展中国家也被赋予减排责任，这一部分是考虑发展中国家排放量和占全球排放的份额不断增加的现实。另一方面也兼顾了发达国家要求发展中国家参与减排的诉求。没有发展中国家参与减排的国际条约是不可能达成的。

# Abstract

Global climate change not only does great harm to the fragile ecological environment in the ocean and coastal zone, but also directly threatens to human's survival and development. International community finally realized that countries should try to reduce greenhouse gas emission, adopting a global warming limit of 2 or below (relative to pre-industrial levels). However, different countries have different economic developing levels and are of different influences by climate change. What is more, the economic foundation and motivation of developing low-carbon economy are different, which makes it hard to reach the consensus of opinion among developed countries and developing countries on responsibility of reducing $CO_2$ emission. This study aims to build up the model of distributing the responsibility of reducing $CO_2$ emission, taking into account the interests developed and developing countries, together with the efficiency principle of developed countries and egalitarian principle of developing countries, providing a scientific and feasible basic for negotiations of international $CO_2$ emission reduction. The research results of this paper are as follows.

1) This paper is based on the analysis of various moral and ethical issues, as well as different national interests in international climate change negotiations, putting forward to follow the theory of equal rights based on efficiency in $CO_2$ emission responsibility allocation. This theory embodies the moral and ethical principle of different countries, which can be compatible to the interests of developed and developing countries, and also considering the challenge of economic growth and poverty reduction, which improving the efficiency of utilization of $CO_2$ capacity.

2) This paper is based on the above theory, building up the model of distributing the responsibility of reducing $CO_2$ emission together with egalitarian principle and efficiency principle. This model is based on the equality of rights, including absolute equality of basic rights (everyone enjoys the equal basic emission), as

well as the equal proportion of non-basic rights (non-basic CO2 emission is of equal proportion related to the contribution to the world economy). Because of the distribution of non-basic CO2 emission is of equal proportion related to the contribution to the economy, this model embodies the principle of efficiency.

3) This paper deals with the data of TOP 20 CO2 emission countries based on the model and estimates the max total possible emission from 2005 to 2050. Mostly, developed countries need to reduce emission year by year; Developing countries' emission presents a downward trend after rising first, the peak is in 2020; A small number of developing countries, such as Brazil, India, Indonesia, etc., they don't need to reduce emission due to their current emission is smaller than basic emission. This result has almost the same appeal comparing to the developing and developed countries.

4) This paper estimates the distribution of responsibility of reducing CO2 emission among TOP 20 CO2 emission countries from 2005 to 2050. The reduction of annual CO2 emission of developing countries, such as China, presents an upward trend after declining first; Future reduction of annual CO2 emission of developed countries, such as the USA, shows the increasing trend year by year, but the radian becomes smaller. Ultimately, the CO2 emission per capita will be relatively close in both developed and developing countries. This result, on one side, gives developing countries more opportunities in development, meeting the development rights of developing countries. Developing countries have also been given responsibility at the same time, which on the one hand considering the reality of the developing countries' increasing CO2 emission share of global emission. On the other side, it also considers both appeals of the developed and developing countries' participation in emission reduction. There is no way to achieve an international reduce emission treaty without the participation of both developed and developing countries.

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