ARTICLE
Two Kinds of Analysis in the Issue of Dealing with EDPs

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ABSTRACT

The settlement of EDPs [1] is one of the most knotty problems created by climate changes. In this paper, our team will give a comprehensive solution to tackle it. We construct two migration models to maximize the outcome of protecting the rights of EDPs and preserving their unique culture. Firstly, we talked about the reasons why we should protect the rights and culture of EDPs. We conclude that it is not only the spirit of UN, the morale responsibilities of every nation but also a good deed for human being which possibly can stop nationalism in each country from rising. I this process, we decide to use "carbon dioxide emission per capita" as standard to distribute responsibilities to different nations because it is more fair and efficient. Secondly, we start to build Migration Models. By using AHP, We quantify the important characteristics which will eventually make a big difference on the outcome of settlement. Then we get final results which indicate the most suitable countries for EDPs. Analyzing the results of Migration Models, we give policy recommendation at global and national level. For the first one, we suggest that UN should decide where EDPs' be; when emergency happens or there are only few migrants, send them to the nearest countries to make sure of their safety and preservation of their cultures; and when it takes a long time to migrate and there are so many migrants, use Migration Model Two to decide because it needs to take the contribution to the world greenhouse effect, countries' finance and preference of EDPs into consideration. Through the mathematic practice, we also find some factors, such as languages, population density and religious beliefs, can seriously affect the ultimate choice of the migration place so we recommend each nation positively take action to ensure EDPs can easily fit in. After that we bring time factors into our model. We use linear regression model to see the time when those island nations will be submerged. It indicates that UN should step in this issue as soon as possible otherwise it can be uncontrollable owing to the sinking islands and rising nationalism. At last, we list and compare three approaches to deciding where the home of EDPs should be. We conclude that only when UN in charge of this, it can make the best interest of both EDPs and different nations.

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1. Introduction

1.1 Background

Climate changes have been a more and more serious issue for human being. Dreadful scenes, such as people living in the islands looking hopelessly at the ruins of their house after a hurricane or being rejected by the migration country, have aroused compassion all over the world.[2] Gradually we realize that it is the disaster of human being but not just the EDPs and so needs to be dealt with as a whole. Recently, a released UN ruling opened the door to the theoretical recognition of EDPs as refugees, which means EDPs will get protection by law in the near future. However, at this time, nations haven't reached an agreement about how to deal with these EDPs because too much interests and responsibility are involved in. How to deal with this knotty problem becomes a heated topic for the experts in all fields.

1.2 Restatement of the Problems

It is such a comprehensive issue that there is no way to take all aspects into account so our team make deep discussion on 5 of them. Here's how we consider this matter:

(1) What's the situation of EDPs?

(2) How do they change over time in terms of both the number of people and their culture?

(3) Why should we protect EDPs and what's the value of protecting those cultures of at risk nations?

(4) Where would their new home?

(5) Who can decide this, EDPs, each nation or UN?

(6) A recommendation for UN and nations to make their best in protecting human rights and culture preservation.

2. Why Should We Protect EDPs

2.1 The Value of EDPs' Culture

If an island nation wants to develop and survive for a long time, the culture of this country is extremely essential, because the culture of an island country has an immeasurable influence and effect on its economy, politics, comprehensive national strength and national quality, which is also the spiritual power for the residents of this island country to survive and develop continuously. The language, music, art, dance, social norms and cultural heritage may have great difference from island to island, even if they live within the same island chain. This is the so-called cultural difference. When the islanders have to move because of the rising sea level caused by the rising climate and global warming, their cultural heritage and customs will be greatly affected, which will heavily affect their normal life. Traditional marine fishing techniques used in the Marshall Islands, for example, are unlikely to be continuously used by families living in the Alps because of different geographical locations. In addition, the language barrier of island residents after migration also requires them to spend time to adapt and change. So it will have a great impact on their lives. In the future, as island residents continue to disperse, they will face the risk of losing their unique cultures, languages and cultural heritage. So for environmentally displaced persons, new resettlement efforts may be the last chance to rebuild their homes and preserve their cultures. Therefore, as for the perspective of existing and potential climate refugees, it is hoped that they can migrate to places where cultural heritage and cultures are suitable for their lives.

2.2 Quotation from UN

In the UNESCO World Declaration on cultural diversity issued by the United Nations, it is mentioned that "culture has different forms of expression in different times and places, and cultural diversity is the common heritage of mankind, which should be recognized and affirmed in the interests of the present and future generations." Therefore, in today's increasingly diversified society, it is necessary to ensure the harmonious relationship and coexistence of individuals and groups with diverse, different and developing cultural characteristics. This is also inseparable from the protection of human rights. To protect and assist these environmentally displaced persons, their cultures and human rights are fully in line with and actively respond to the urgent ethical need of safeguarding cultural diversity as stated in the United Nations Declaration. What's more, we should respect the rights of minority groups and indigenous people, and should not damage or limit the scope of human rights protected by international law on the basis of cultural diversity. Therefore, when environmentally displaced persons move to other different countries, it is necessary for all the countries to protect their cultural heritage and human rights.

2.3 Morale Responsibility of Other Nations

Because of the rising sea level, those island refugees who are in danger of their land disappearing completely need international support and responsibility from other countries for their successful migration and long-term survival and development which can greatly help them adapt to the new environment. The cause of sea-level rise is the aggravation of global warming. It is inseparable from the outcome of greenhouse gases produced by all the countries in

the world. Therefore, under the leadership of the United Nations, all countries around the world should give a helping hand to EPDs, and shoulder their due international responsibilities, and properly handle the cultural heritage relations between their own residents and EPDs. Our group believes that if we want to share the burden fairly among countries, we should give them different proportion of responsibility according to the measurement of the amount of greenhouse gases produced by each country. Next, we will use data analysis to improve our point of view.

2.4 Our Principles to Distribute Responsibilities

Why Should We Choose "Total Amount of Carbon Dioxide Emission"

According to the average data in recent years, China is the country with the largest annual carbon dioxide emissions, with annual carbon dioxide emissions of 103.57 million tons. The second is the United States. According to the 2016 report of the American Lung Association, more than half of the people in the United States are facing the risk of breathing air pollution. Its carbon dioxide emission is 54.14 million tons. The next is India. There are 1.2 million people die of respiratory diseases every year in India, with the annual carbon dioxide emissions of 22.74 million tons. And then are Russia, Japan, Germany, Iran, Saudi Arabia, South Korea, Canada, etc.

We think that the amount of carbon dioxide emissions of a country is closely related to its comprehensive national strength and development level. Many developing countries are rising stars, so we can see that the carbon dioxide emissions of these developing countries will continue to rise in the future. But before that, the developed countries, which are temporarily leading in the comprehensive level of industry, have already had quite high carbon dioxide emissions, so we should take totally historical carbon emissions to measure the "contribution" of every country in the world to the serious greenhouse effect.

3. Migration Models

3.1 How to Choose Home for the EDPs

We suppose that it is necessary for the United Nations to formaly draw up the policy of the immigration for the environmentally displaced persons (the explanations of it will be showed in the forth section). If the policy lets the environmentally displaced persons freely choose their destinations of the immigration by themselves, it will causes a great many unpredictable results. For example, some malicious media will make up public opinion to uglify some countries who do not want to receive those environmentally displaced persons. It is one of the harmful results of too many rights to freely choose areas by refugees themselves. What's more, it will also make trouble if refugees select countries that only depend on welfare benefits and treatments or other economic standards. On the one hand, some countries with higher and better welfare benefits will have heavy burdens. On the other hand, environmentally displaced persons maybe have some difficulties in accommodating to a completely new and different places and local cultures.

In order to successfully protect both their human rights and original cultures which can let them settle down in a new country and fully enjoy their new lives, we draw up two plans of immigration. And these plans can make sure that refugees' original cultures' continuity can be protected to the utmost and those chosen countries have enough abilities and is willing to help and accept the environmentally displaced persons.

The analysis of these two arrangements of immigrations:
Model one:
The "nearby" in "nearby immigration" means the cultures' similarity, but it always turns out to be the locations' similarity.

(1) It can protect the continuity and completeness of their original cultures to the utmost.

(2) It is beneficial for the environmentally displaced persons to peacefully and comfortably get use to the new environment.

(3) It is easy to guarantee their human rights since they successfully get use to the new place.

(4) It may have difficulties in carrying out the plan . Here are two preconditions which are not easy to satisfy. Firstly, we should match the features of human geography between the immigrants and local people. [4]Secondly, we should know the number of the refugees that the countries which are the destinations of immigrations can accept. For example, the environmentally displaced persons nearby the Pacific Ocean are suitable to immigrate to Japan. If it happens, it will do great harm to the society and environment of Japan which can lead the extent of receiving refugees from the local people decreases. Therefore, the effects of this plan will be badly influenced.

Model two:
Receiving diffierent immigrants should base on the quota of diffierent country. As mentioned above, based on the requirement of fair burden sharing, the number of new residents absorbed by countries should be driven by their obligations to contribute to climate change. [3] And the countries that contribute the most to climate change have more moral obligations to bear the greater burden of receiving the environmentally displaced persons.

(1) It can help to successfully implement the policy. On

a unified scale, the United Nations considers the natural environment and the financial capacity of the country of the immigration to select the appropriate and fair number of refugees. In this way, the method determined by the international authoritative organization ensures the realization of equity, thus maximizing the support of various countries.

(2) The huge differences in geographical and human conditions lead to many difficulties of those refugees to adapt to the immigration.

(3) Governments need to work hard to establish policies to protect the human rights of the environmentally displaced persons and their culture.

We decided to divide the refugees into two groups, one is that we can find a place suitable for them to live in, and the other is that we are not easy to find. For the group I, we will adopt the first arrangment which is to place them in an environment suitable for their living and protect the continuity and completeness of their original cultures to the maximum extent. As for group II, we give priority to the acceptance ability of different countries for refugees and make a reasonable distribution.

3.2 Variables

α: Eigenvector

β: Empowerment and vector

λ_{max}: The average value of empowerment and vector

CI_1: Consistency indicators of geographical environment

CI_2: Consistency indicators of population situation

CI_3: Consistency indicators of cultural customs

CI_4: Consistency indicators of carbon emission

CR_1: Consistency rate of geographical environment

CR_2: Consistency rate of cultural customs

CR_3: Consistency rate of population situation

RI: Freedom index

CR_4: Consistency rate of carbon emission in the last 10 years

3.3 Model One

3.3.1 Brief Illustration of the Model One "Tuvalu cases"

At present, with the increasing greenhouse effect, many island nations like Tuvalu, Tonga with low altitude are facing the risk of global warming, rising sea level and the risk of being submerged by the sea and homeless. The rising of the sea level is increasingly threatening the lives and property security of the island people. So when the island nations disappear caused by sea level, they have to face the problem of immigration. So how to reasonably settle these

environmentally displaced persons to various countries in the world and find suitable places for their survival and development is a serious problem nowadays. To solve the problem, we will take Tuvalu as a typical example.

Located in the South Pacific Ocean, Tuvalu is composed of nine circular coral island groups, covering an area of about 26 square kilometers. Due to the extremely low terrain, the highest place in Tuvalu is only 4 meters above the sea level. The rise of sea level caused by the greenhouse effect threatens Tuvalu seriously, and it is also a very serious threat to the whole world. Where will the residents of Tuvalu go? Next, we will use analytic hierarchy process (AHP) to demonstrate how can island nations like this with a large number of the environmentally displaced persons choose a good destination of immigration. The reason why we choose AHP is that it combines qualitative analysis with quantitative analysis to complete the following steps, and then it will give quantitative results of decision problems.

There are many countries around Tuvalu, and those countries closer to Tuvalu are more likely to make Tuvaluans adapt to their living conditions than other countries in the world. Their climate change and equation of time and so on are quite similar. At the same time, Tuvalu has a small territory and a small population, so we choose national immigration. We have selected three representative countries that are able to accept the environmentally displaced persons. They are New Zealand, Australia and Indonesia. We use AHP to see which country is more suitable for Tuvalu's climate refugees. We summarize the 10 criteria of evaluation into the following three aspects:
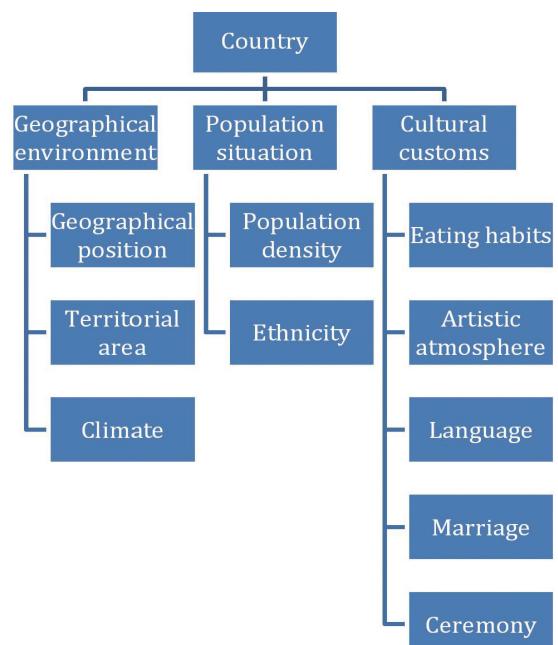
3.3.2 Assumptions

(1) Tuvalu does not purchase other lands from other countries for immigration preparation.

(2) New Zealand, Indonesia and Australia accept all the immigrants. (no rejection)

(3) Tuvalu has no preference for New Zealand, Indonesia and Australia.

(4) Tuvalu regards nearby immigration as the most efficient way of immigration.

3.3.3 Model Logic and Structure

(1) Logic

First of all, we believe that the goal of "perfect migration" is not only the movement of people., but also the protection of human rights of the environmentally displaced persons as much as possible in terms of culture, quality of life, language and religion. So we look up the data of geographical location, land area, climate conditions, population density, race, eating habits, artistic atmosphere, language, marriage, etiquette and other aspects as the basis of analysis.

Then we will summarize these aspects into three categories: geographical location, population situation and cultural customs. According to the comparison between different countries, we will give different weights, and finally find the most suitable country for Tuvaluans.

(2) Structure of the model
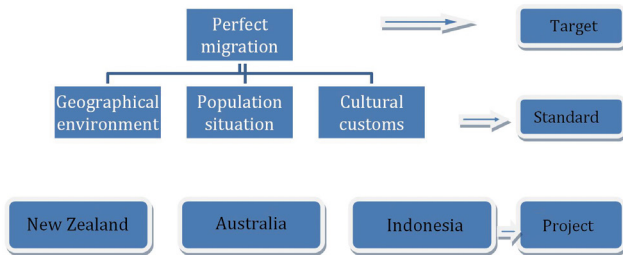
Following is the model structure:

(1) The decision-making problem is divided into three levels: target level, standard level and project level. The hierarchy diagram is shown above.

(2) We will carefully and repeatedly compare each other to determine the weight of each aspect to the final goal, as well as the weight of each scheme to each criterion.

(3) The above two weights are integrated to determine the weight of each scheme to the target.

3.3.4 Mathematic Practice and Conclusion

Scale and comparison matrix

Relative importance scale a_{ij}, and it is the comparison of two schemes under a certain standard to get the relative weight.

We are suppose that there are n factors: X={x-1,x2,…,xn}, We need to compare their impact on a criterion or goal in the previous layer, and then determine the proportion of a criterion in that layer. $a_{ij} = \frac{1}{a_{ji}}$

Scale:

aij	Definition
1	i is as important as j
3	i is slightly more important than j
5	i is more important than j
7	i is a bit more important than j
9	i is absolutely more important than j
2,4,6,8	the scale value corresponding to the intermediate state between the above two judgments
Reciprocal	aij=1/aji

Comparison matrix:

Firstly, we calculate and estimate the relative data and write down the positive reciprocal matrix based on geographical environment, population situation and cultural customs of those target countries and work out its eigen value. What's more, we have to the empowerment and vector and the average value of empowerment and vector. (In the appendix)

	Geographic environment	Population	Cultural heritage	α
Geographic environment	1	3	2	0.539
Population	1/3	1	1/2	0.164
Cultural heritage	1/2	2	1	0.297
	1.833	6.000	3.500	

Secondly, Consistency test:

According to the following equation, we can work out CI_1, CI_2, CI_3

$$CI = \frac{\lambda_{max} - n}{n-1}$$

CI_1=0.048 CI_2=0.009 CI_3=0.048

Dimensionality (n)	1	2	3	4	5	6	7	8
RI	0.00	0.00	0.58	0.96	1.12	1.24	1.32	1.41

According to $CR = \frac{CI}{RI}$, we can work out the follow-

ing results:

$CR_1=0.083$ $CR_2=0.016$ $CR_3=0.082$
$CR_1 \leq 0.1$ $CR_2 \leq 0.1$ $CR_3 \leq 0.1$

When $CR \leq 0.1$, it indicates that we have passed the consistency test.

Thirdly, Final results:

Country	Score
New Zealand	0.173
Australia	0.668
Indonesia	0.159

Fourthly, Conclusion:

According to the result, Australia get the highest score. So we think that Australia is the most appropriate country for the Tuvaluans to immigrate among these three countries. It is reported that Australia government has refused the application to receive the environmentally displaced persons from the Tuvalu nowadays. So we propose the advice that the United Nations should take some actions to improve the relationship between Australia and Tuvalu and try everyone's best to protect the environmentally displaced persons' rights and cultures.

3.4 Model Two

3.4.1 Brief Illustration of Model Two "Maldives cases"

Covering an area of 90,000 square kilometers, Maldives has 26 sets of natural ring firewood and 1,192 coral islands. 200 of these islands have permanent residence. These islands average 10,000 to 20,000 square kilometers and a sea level of 1.2 meters. It is about 600 kilometers from the south of the India and around 750 kilometers from the south of the Sri Lanka.

Through the deep research on the rock core got from the Maldives islands, researchers have found that, nearly 10,000 years ago, the sea level of Maldives' islands rose at a shocking speed of 15 meters per thousand years owing to the meltdown of the icebergs in North Pole. Coincidentally, the coral reef around the area grows at the same speed and thus not get swallowed by the ocean. It is important to note that all of the beautiful scenes in Maldives lie in a sea level of only 1.8 meters and over 80 percent of their lands have a sea level of less than 1 meter. To be more specifically, the ocean will swallow these cute and beautiful islands one by one in less than a century, if the data from UN is reliable. That's why we choose Maldives to build our Model Two. Compared with Tuvalu, Maldives have many times both the land and the population as

Tuvalu. So it is impossible for the residents in Maldives to move to a certain country together. Besides, considering the different contribution to the World Green House Effect, we add one more factor-carbon emission into our model to make the plan more fair.

3.4.2 Assumptions

(1) Maldives can't move to another country as a nation.

(2) Maldives doesn't prepare lands for the migration.

(3) Maldives have no preference to migration countries.

(4) The residents can accept migration country.

(5) China, America, Russia and India takes up the total carbon emission and ignore other countries' contribution.

(6) Owing to the limited ability of accepting refugees, such as government finance and population intensity, these countries can only take in 20 percent of the total refugees. The major 4 carbon emission countries are responsible for the rest 80 percent.

3.4.3 Model Logic and Structure

(1) Model Logic

We haven't simply use weight coefficient of carbon emission to distribute the burden of receiving EDPs because it will have negative impact on the preservation of at risk nations. How can we make plans for these refugees totally out of our wills but not theirs at all. If we do so, it is easily to imagine that lots of conflicts will take place through their fitting into the local society. Not only will it make harder for the refugees to fit in, but it will also put too much pressure on some countries' finance because we haven't take the will of EDPs and ability of migration country into account. Hence we should take both the carbon emission factor and population characteristic factors into the model. The factor we choose in Model Two includes geographic location, square of the country, climate, population intensity, ethnicity, food habit, art, languages, marriages and ceremonies. We divide these 11 factors into 4 categories:
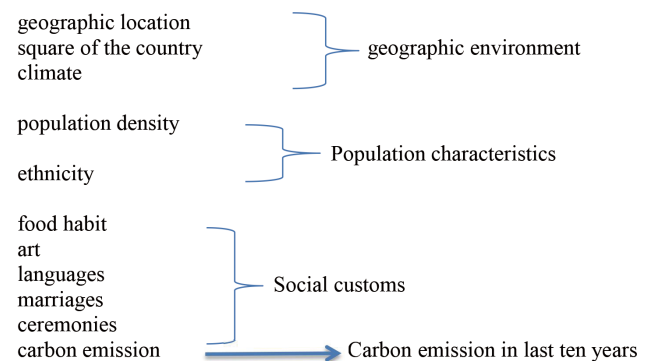
(2) Structure of the model
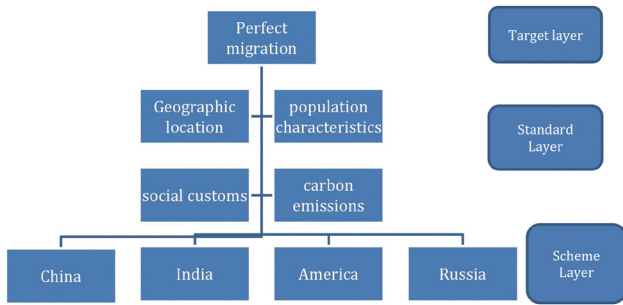
Here comes how we choose migration country:

(1) The decision-making problem is divided into three levels: target level, standard level and project level. The hierarchy diagram is shown above.

(2) We will carefully and repeatedly compare each other to determine the weight of each aspect to the final goal, as well as the weight of each scheme to each criterion.

(3) The above two weights are integrated to determine the weight of each scheme to the target.

3.4.4 Mathematic Practice and Conclusion

(1) Scale

It is totally the same as the model one.

(2) Comparison matrix

Firstly, we calculate and estimate the relative data and write down the positive reciprocal matrix based on geographical environment, population situation and cultural customs of those target countries and work out its eigen value. What's more, we have to the empowerment and vector and the average value of empowerment and vector. (In the appendix)

Carbon emission:

Country	Carbon dioxide emission(10,000tons)
China	88035
America	46019
India	19329
Russia	12936

Comparison Matrix:

	Carbon dioxide emission(10,000tons)				α	β	λmax
Country	China	America	India	Russia			
China	1	1/3	1/7	1/8	0.050	4.012	
America	3	1	1/3	1/4	0.127	4.019	4.044
India	7	3	1	1/2	0.321	4.063	
Russia	8	4	2	1	0.502	4.084	
	19.000	8.333	3.476	1.875			

Secondly, Consistency test:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

According to the following equation, we can work out , CI_1, CI_2, CI_3, CI_4

CI_1=0.082 CI_2=0.017 CI_3=0.050 CI_4=0.015

Dimensionality (n)	1	2	3	4	5	6	7	8
RI	0.00	0.00	0.58	0.96	1.12	1.24	1.32	1.41

According to $CR = \frac{CI}{RI}$, we can work out the following results:

CR_1=0.091 CR_2=0.019 CR_3=0.055 CR_4=0.016
$CR_1 \leq 0.1$ $CR_2 \leq 0.1$ $CR_3 \leq 0.1$ $CR_4 \leq 0.1$

When CR ≤0.1, it indicates that we have passed the consistency test.

Thirdly, Final results:

Country	Final results	percentage
China	0.165	16.548%
America	0.177	17.743%
India	0.213	21.327%
Russia	0.444	44.382%

Fourth, Conclusion:

In the first place we have assumed that 20 percent of the Maldives's population move to the nearest countries and the rest of them will move to the 4 major carbon emission countries. According to our percentage converted from final results, China, America, India and Russia are respectively responsible for 16.548%, 17.743%, 21.743%, 44.382% of the undistributed population.

3.5 Policy recommendation

Our policy recommendation includes two parts: the first part is at the global level and thus to the UN. It helps them efficiently and fairly coordinate the efforts coming from all the countries. Our attention to the human rights and culture preservation lies in how we choose migration country for them; the other part is at the national level and thus to each nation. At this time, our care for the rights and culture of EDP is really clear.

3.5.1 Global Level

(1) When emergency happens or there are only few migrants, use migration plan one(model one)

Model one is focused on the realization of immigration plan one that immigrants are accepted from only one or a few countries which have talked above. It is beneficial for EDPs to survive in the new environment and retain their

cultures. This model is suitable for an island nation with a small territory and population. At the same time, it is a model of immigration with relatively small economic consumption and short time. Therefore, when an emergency causes the country to be submerged, model one can relatively quickly provide a new home for EDPS, but the UN should coordinate and grant some welfare policies of the host country at the same time.

(2) When it takes a long time to migrate and there are so many migrants, use migration plan two(model two)

Model two is focused on the realization of immigration plan two that immigrants are accepted by many countries at the same time which has mentioned above. This model is suitable for an island nation with a big territory and population.[5] It is a model of immigration with relatively big economic consumption like using tens of thousands of steamships and planes to pick up EDPS and a long time. Also, this model which will last for a long time and constantly carry on can be planned in advance. At the same time, the UN should coordinate and grant different welfare policies and assistance to different countries that have many EDPs.

3.5.2 National Level

According to the above research we have made, we are going to put forward some suggestions to assist those EDPs:

(1) Each country should set up a special organization mainly dealing with EDPs related matters and establish a foundation to receive nationwide assistance. And countries should try their best to put forward arrangement and measures for the protection of EDPS as soon as possible. It is greatly beneficial for everyone to maintain the stability of the whole country and even the whole world.

(2) All the countries should organize some national conferences on EDPs assistance to increase the sense of responsibility of the whole world's nations and increase the attention and acceptance of EDPS related issues by the whole world's nations.[6]

(3) Each country should set up special institutions in all parts of the country, which is used to adopt the suggestions of EDPS and its own residents about EDPs matters. These special institutions must fairly and peacefully deal with the matters between EDPs and its own residents, while ensuring that EDPS and its own residents have the same rights and obligations. It aims to avoid conflicts between the residents of the two countries.

(4) Nations should put forward some relevant laws to protect the rights of EDPs[7], such as the right of life, the right of health, the right of food, the right of fresh water. All the nations shall fulfill their duties to protect the human rights of EDPs through a series of measures and laws.

(5) After receiving EDPs, each country should set up a special language organization to train EDPs in their own language, and at the same time teach a small amount of basic use of the language used by EDPs to its own residents, so as to promote the integration of EDPs with local residents and cultures.

(6) After receiving EDPs, each country should regularly organize national cultural exhibitions to show the cultural heritages, customs and religious beliefs of EDPs' countries and the countries they have moved in. It can greatly create an atmosphere of mutual respect and inclusiveness which will do good to its cultural diversity, integrity and independence of active protections, and promote the perfect integration of the language, cultural heritages and religious beliefs of the environmentally displaced persons and the local communities.

4. Time Factors

4.1 Mathematical Practice

As we have mentioned above, we have written two different kinds of immigration arrangement for different situations of environmentally displaced persons in different countries. But one of the very important factors in the immigration plan is the time factor that when the island country is submerged or no longer suitable for people to live in. The data of this time is very closely related to the immigration plan. Therefore, we build a model three to have a general prediction of the time when the island country is submerged.

4.1.1 Model Logic

We find that the main cause of the rising sea level is global warming, and the main cause of global warming is the emissions of carbon, so we assume that carbon emissions are directly related to sea level height. Because the sea level in different regions of the world is different, we analyze the relationship between the carbon dioxide emissions and sea level in the past 100 years based on the sea level height and carbon dioxide emissions in 1920. And we find the specific relationship between them by linear regression method and predict the future sea level changes and the submerged time of island countries through the equation we work out .

4.1.2 Assumptions

(1) It is assumed that there is no rising of elevation caused by coral reef changes in the island countries. There

will be no other factors causing the elevation rising of the island countries.

(2) It is assumed that the only factor causing sea level rise is carbon dioxide emissions, and other factors are ignored.

(3) Assuming that in the future, every country will not carry out any environmental policies and measures. At the same time, there is no increase of carbon emissions. And the global annual carbon dioxide emissions increase will remain basically the same.

(4) When using this model to predict the future sea level changes and the submerged time of island, it is assumed that the sea level growth rate and annual carbon emissions are unchanged, which are 7.5 mm/year and 30 billion tons per year respectively:

A: assumed sea level height of the island country in 1900

B: assumed global carbon dioxide emissions in 1900

4.1.3 Specific Steps

(1) Firstly, we look up the data of the sea level growth and carbon dioxide emissions in different years. And then we get the following form:

Year	1900	1910	1920	1930	1940	1950	1960
The height of sea level	a	a+49	a+102	a+149	a+201	a+264	a+339
Carbon dioxide emissions every ten years	b	b+2300	b+4620	b+6790	b+9160	b+11690	b+14020

| Year	1970	1980	1990	2000	2010	2020
The height of sea level	a+94	a+106	a+119	a+134	a+144	a+156.5
Carbon dioxide emissions every ten years	b+16790	b+19690	b+22690	b+25860	b+29060	b+32330

(2) Based on these data, a linear regression model is established

data	{{6790, 149}, {9160, 201}, {11690, 264}, {14020, 339}, {16790, 409}, {19690, 477}, {22690, 551}, {25860, 622}, {29060, 701}, {32330, 769}}
model	linear function

(3) Fit diagnostics

AIC	BIC	R^2	adjusted R^2
75.8656	76.7733	0.998477	0.998287

(4) Plot of the least-squares fit
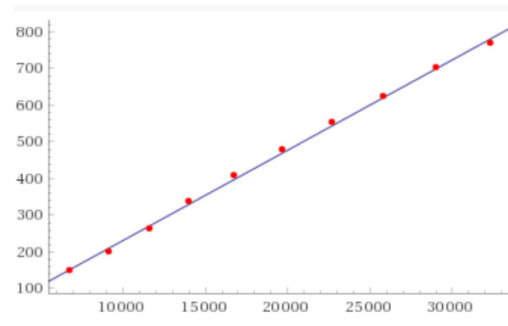
Plot of the residuals:
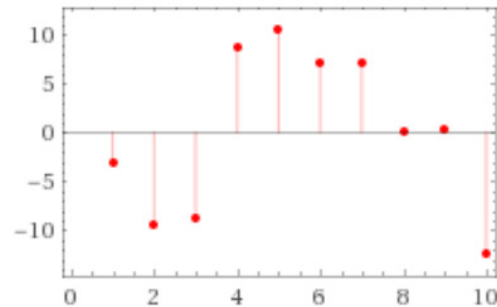
(5) Least-squares best fit
Y=0.0246349x-15.134

4.2 How do the time factors affect Migration Models

Taking Maldives as an example, it is assumed that there are no other factors that cause the elevation of Maldives to rise or fall, and the elevation of Maldives is only determined by sea level. According to the data we have found, the average altitude of Maldives is 1.2m now. According to the above equation we have worked out, we can get x ≈ 49325.712708393. According to the hypothesis, we can know that the annual carbon emission is 30 billion tons per year. We can know that Maldives will be submerged after about 60 years, so we should put forward corresponding policies to protect the human rights and cultures of environmentally displaced persons as soon as possible.

5. Who should have the power to make plans for EDPs

Comparison between Different Approaches

After we compare 3 approaches to make decision on migration plans, we find that only UN has the ability to make it work:

(1) When EDPs deciede where they go

If the decision is made by personal intention, it is more about subjective factors than objective analysis, which will lead to some developed countries--the majority of people's choice, but this is totally unfair. At the same

time, the subjective factors will lead to inconsistency or even conflict between EDPs' cultural environment and the culture of the chosen country. Everyone has his or her own favor, but in terms of making the decision of choosing different places to live in, we need to consider other factors, such as economy, politics; people often feel hard to make the most suitable choice for their own because of the difficulties in analysis and data access decisions. At this moment, people require a special institution that can base on the condition to analyze, recommend and make the most nicest choice.

(2) When each nation decide where EDPs go

If the choice is made by the nation, it is more likely to lead to unfair decisions. Due to the existence of some historical and objective factors, cultural and racial discrimination may exist in some countries. Therefore, EDPs will not be selected equally, which is not conducive to world peace and stability. What is more, it is a fatal blow to some cultures. In addition, the national policies must be based on the maximization of national interests, which means that the choice of EDPs is based on its own interests rather than the protection of EDPs' right and culture. It will cause damage to EDPs' right and its culture heritage.

(3) The reason why we think UN is most suitable to make decisions

To sum up, we choose the United Nations as the leader to introduce relevant policies and plans for unified deployment.

Firstly, the purpose of the United Nations is to maintain peace everywhere in the world; To develop friendly relations between countries; To help countries work together to improve the lives of poor people, to combat hunger, disease and illiteracy, and to encourage respect for each other's rights and freedoms; To be the focal point for coordinating national action to achieve these goals. The protection of EDPs' human rights and culture is consistent with its purpose.

At the same time, the United Nations is a combination of different sovereign states, which can provide a fair environment for different states to discuss relevant matters related to EDPs so as to safeguard the interests of each state and avoid possible disputes. Moreover, the United Nations can obtain a lot of first-hand data for analysis and discussion. Through comprehensive consideration and objective analysis, it will select the most appropriate countries for EDPs in different regions to realize their own human rights and protect their unique culture heritage.

Finally, the United Nations has more experience to deal with similar situations and more tools to deal with them such as the Afghan refugee problem nowadays. And

UN has the UNITED NATIONS HIGH COMMISSIONER FOR REFUGEES, which in more than 50 years has helped some 50 million people rebuild their lives. By the end of 2014, there were 7,685 staff in 125 countries helping refugees and others. Therefore, the United Nations can set up specialized agencies and specialized personnel to deal with the things relation to the EDPs' matters.

6. Conclusion

6.1 Strengths and Weaknesses Analysis

6.1.1 Strengths

(1) When using analytic hierarchy process, we established the level of all elements (including non-quantitative and quantitative), and clearly show the relationship between each level, each criterion and each element. When it comes to the comprehensive evaluation of different countries, it will be decomposed layer by layer and analyzed comprehensively on the basis of multiple single criteria evaluation. The data we work out is more convincing.

(2) AHP makes the evaluation program clearer and easier to understand, and let the calculation process go on smoothly, which is a simple and practical measure. According to the importance degree of the comparison results, the quantitative scale is 1 to 9, and the qualitative analysis can be changed into quantitative analysis reasonably and sufficiently.

(3) AHP transforms the collected information into a matrix set, and then processes it by using the linear algebra theory and method we have learned, which can provide deep and substantial data support for the final goal decision-making.

(4) When using analytic hierarchy process, if there are missing or insufficient parts in the research data, the importance of each element can still be obtained. It is a great convenience for us to collect information.

6.1.2 Weaknesses

(1) It is sometimes difficult for using AHP to compare two different elements. Sometimes it may have a little subjective tendency.

(2) AHP can not directly calculate and generate new decision-making scheme, but can only choose the best one among many given strategies.

(3) In the multi-level comparison of AHP, if the consistency index is not satisfied, the decision result calculated by AHP will be invalid.

(4) In the linear regression model, when model 3 is used to predict the submerged time of island nations, for the global carbon emissions are uncertain every year in

the future, there will be some minor errors if the carbon emissions increase at a constant rate.

Appendixes

Model One:

Geographic Environment:

	Geographic Environment			α	β	λmax
Country	New Zealand	Australia	Indonesia			
New Zealand	1	1/8	1/4	0.07	3.016	
Australia	8	1	5	0.723	3.204	3.096
Indonesia	4	1/5	1	0.206	3.068	
	13	1.325	6.25			

Cultural heritage:

	Cultural heritage			α	β	λmax
Country	New Zealand	Australia	Indonesia			
New Zealand	1	1/2	3	0.32	3.019	
Australia	2	1	4	0.557	3.03	3.018
Indonesia	1/3	1/4	1	0.123	3.006	
	3.333	1.75	8			

Population:

	Population			α	β	λmax
Country	New Zealand	Australia	Indonesia			
New Zealand	1	1/4	5	0.244	3.08	
Australia	4	1	8	0.689	3.191	3.096
Indonesia	1/5	1/8	1	0.067	3.016	
	5.2	1.375	14			

Model Two:

Geographic enveirionment:

	Geographic environment				α	β	λmax
Country	China	America	India	Russia			
China	1	1/2	6	1/5	0.170	4.185	
America	2	1	4	1/3	0.219	4.376	
India	1/6	1/4	1	1/7	0.053	4.045	4.246
Russia	5	3	7	1	0.557	4.377	
	8.167	4.750	18.000	1.676			

Cultural heritage:

	Cultural heritage				α	β	λmax
Country	China	America	India	Russia			
China	1	3	1/3	2	0.233	4.061	
America	1/3	1	1/5	1/2	0.085	4.024	
India	3	5	1	4	0.542	4.102	4.051
Russia	1/2	2	1/4	1	0.140	4.018	
	4.833	11.000	1.783	7.500			

Population:

	Population				α	β	λmax
Country	China	America	India	Russia			
China	1	1/3	3	1/6	0.104	4.059	
America	3	1	7	1/4	0.247	4.164	
India	1/3	1/7	1	1/9	0.045	4.028	4.149
Russia	6	4	9	1	0.604	4.343	
	10.333	5.476	20.000	1.528			

References

[1] JP Guo, GQ Shi. Environmental refugees or environmental migrants - A Review Of the Study on the Appellation and Definition of Environmental Migration at home and abroad[J]. Nanjing Journal of Social Sciences, 2010(11).

[2] G. Kibreab. Environmental Causes and Impact of Refugee Movements:a Critique of the Current Debate, Disasters, 1997(21): 30.

[3] Derek R. Bell. Envrionmental refugees: What rights? Which duties? Georgetown International Environmental Law Review. 2011: 138

[4] UNHCR. Summary Of Deliberations On Climate Change And Displacement, International Journal of Refugee Law. 2011: 567.

[5] Neil Hodge. Global Environment: Acts or Emissions. International Bar Association Global Insight, 2012.

[6] Benoit Mayer. The International Legal Challenges Of Climate-induced Migration: Proposal for an International Legal Framework. Colorado Journal of International Environmental Law and Policy, 2011: 406

[7] HL Sun. A Legal thinking of the "Environmentally displaced persons"[J]. Legal Review of Nanjing University, 2011, 306.