

# A Consideration on the Behavioral Principle PD Led from the Writings of Partha Dasgupta on Facts and Values

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(Abstract)

Can we conquer the difference of values? This is the main theme of this study. Considerations on “Facts and Values” become more important when the state of affairs change drastically because some kinds of values lose their effectiveness then. Values, as a kind of knowledge, enable people to make decisions easily and efficiently because they enable people to decide something without evaluating it under the normal state. If the prerequisites of value judgments, or the state of affairs from which values have been drawn out, change, however, some relating values cannot show the best way that people should take. It may be impossible for an individual person alone without cooperative actions to prevent or mitigate the changes of the prerequisites of value judgments. Thus considering the sustainability of well-being of all the people in the world, cooperation is one of the important strategies to mitigate and overcome the undesirable impacts caused by the change of the state of affairs. Constructing cooperation among people possessed with different values, however, is difficult, because certain values filter certain cognitions of facts in value judgments, and this function of values prevents people from sharing important cognitions. Dasgupta (2001) assumes the existence of core commonality of human mind that might enable people to achieve an agreement when they share the same important cognition of facts. After the introduction of the Behavioral Principle PD led from the writings of Dasgupta (2001) about “Facts and Values”, some of the limits of the Behavioral Principle PD are investigated.

## 1. Introduction

### 1.1. Significance of the Behavioral Principle PD<sup>1</sup>

According to the previous researches, the idea, that sharing the same cognition of facts enables people to achieve an agreement on a complicated problem, is a general notion gained through experiences and shared widely among people. The previous studies introduced as follow show that they are all based on the notion that sharing cognition of facts enables people to achieve an agreement, though they never explain the fact that they are unconsciously and empirically influenced by and possessed with similar ideas as the Behavioral Principle PD introduced in section 3: “When there is a conflict about the cognition of facts of a problem, if we are not concerned about the different values and instead concentrate on sharing the cognition of facts preferentially, it leads people to make similar decisions of action and to cooperate to solve the many unsolved problems, because the core commonality lets people have similar aims of actions and act similarly.” The aim of this article is to show how to derive the Behavioral

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Principle PD from the writings of Dasgupta (2001) and explain the limits of effectiveness of the Behavioral Principle PD with showing some examples.

Doi and Kobayashi (1996) studied the importance of the public involvement in the process of public enterprises. They explain that the levels of knowledge of citizens on the projects influence the attitudes of them toward the projects. They imply that sharing new cognitions of facts can change the results of value judgments of people. Kato et al. (1997) investigated the support system for the collective decision-makings in order to solve the problems of choosing alternative solutions based on the subjective assessments. They introduce the way to decrease the amount of information to share by structuring the indices of assessment and clarifying the mechanism of value judgments in order to share the important cognition of facts among people possessing different values. Hirashima and Yamamoto (1997) considered the needs of the disclosures of information from the viewpoint of the relationship between public enterprises and citizens. They showed the importance of the disclosures of information and of the high level of professional ethics of stakeholders. Iwai et al. (1998) investigated the process of making the execution plans of the public enterprises. They took important the intermediate organizations that gather individual opinions and enable people to reduce the number of times to simulate the way of thinking of the others when they try to achieve an agreement among many people possessing various values. Kato and Kunifuji (1998) introduced the supporting system for collective decision-making, which group consists of people possessing various values. This system supports stakeholders to share the respective ways of thinking with each other and to enable them to agree through mutual understanding. Matsumoto and Kitagawa (1999) investigated the processes in planning a forest road network. They showed the importance for the municipal offices to share information with forest owners and to establish a definite and efficient consensus building system. Kurosawa et al. (2000) considered the balancing between functionality, economy and cares for the environment and local community when they think about the design of canal surroundings. They insisted on the importance of the sharing of related information of the public enterprise among the stakeholders repeatedly. Takano and Suzuki (2002) investigated the support system for decision-making using the new way to solve the conflicts by fixing the alternative solutions. They tried to achieve an agreement between people possessed with various values when these values are difficult to change. Shiomura (2005) investigated a computer-based model of collective decision-making in an artificial society. He explained that people in this model are able to achieve an agreement because they fix their choices and adapt them gradually to the decision of the group they belong to. In other words, the cognition on the decision of the group that they belong to enables people to fix their choices. Hamatani et al. (2005) considered the constructing a model of mental structure of residents in order to achieve an agreement on the new road project. They explained that it enables them to assess the effects of the project and to achieve an agreement easier if they construct a model of what the residents think about the road project. Horie et al. (2007) investigated the assessment

of environment and the support for decision-making on the solution of environmental issues. They pointed out that the decision-making is difficult when there are many conflicts about the assessment. Kuramoto (2009) investigated the target of management of the woodland near the populated area. He pointed out that the opinion of the professionals, which was helpful to achieve an agreement among stakeholders, is not always fair and just for them. According to these previous studies, we can see the idea of the Behavioral Principle PD is wide spread in the real world.

## **1.2. Importance of “Facts and Values”**

Drastic changes of the state of affairs around people, or serious changes in, for instance, climate, market price and culture tend to force them change their ways of value judgments. Since value judgments enable people to decide and execute something efficiently, value judgments play essential role to maintain their well-being. So, in order to keep their well-being from decreasing against the changes in prerequisites of their value judgments, people have to change something in their value judgments. Especially, the scale and power of the changes of the state of affairs are so huge, that no individual person alone probably can manage the situation without concerted action. So when the state of affairs changes drastically, “Cognition of Facts and Values” and how to achieve an agreement are worth consideration<sup>2</sup>. It is one of the reasons why this study concentrates on “Facts and Values” dealt in Dasgupta (2001) which introduces the way to measure the social human well-being considering the nature and sustainability. The investigation on the relation between “cognition of facts” and “values” is a new type of “Facts and Values” issues compared to, for example, the traditional discussions over fact-value dichotomy originated from David Hume.

## **2. How to form cognitions of facts on the state of affairs**

### **2.1. Sustainability and Global Climate Change**

The global climate change issue is one of the most serious problems related to the change of state of affairs accompanying with the issues of “Facts and Values”, because it is deeply related to the problems of sustainability of our civilization. The global climate change is thought to bring about rising sea levels, floods and droughts, disorders in food security, and so on. And also, reconsideration of human activities from the roots is very important since the carbon dioxide emitted from human activities such as burning fossil fuels, which are indispensable for industrial production activities, as well as other greenhouse effect gasses, are all said to be strong reasons behind global climate change.

The problems between global warming and economic growth/development are stated by Uzawa (1995, p. 83), who says, “[Global warming] is strongly related to the processes of economic development in the 20th century, especially after World War II.” Uchiyama (2009, p.

159) recognizes Meadows et al. (1972) because it investigated the relationship between the environmental problems and economic growth/development, and also because it made all of the human beings realize the trade-offs between environmental problems and economic growth.

Uchiyama explains that the concept of “sustainable development” had been introduced in the middle of the 1980s, and that both the solutions of environmental problems and the economic development should not be thought to be trade-off but to be achievable simultaneously. Dasgupta (2001, p. 139) says that the term “sustainable development” was introduced by IUCN for the first time, and that IUCN (1980) encouraged us to consider the role of the natural environment in our economic lives, and that it was after the publication of the WCED (1987), widely known as “Our Common Future” or the Brundtland Commission Report, that the term “sustainable development” became common in the world.

## **2.2. “The economic development” other than the economic growth**

“The Environmental Kuznets Curve” (written as EKC in the following section)<sup>3</sup> is one example that seeks for “the sustainable development”. Uchiyama (2009, pp. 167-180) said that, according to the recent studies<sup>4</sup>, the shapes of the EKCs of carbon dioxide are the reverse letter-U type. He finally concludes, however, that it is wrong to think of economic growth as the ultimate effective solution against the global warming issue. And he points out that the meanings of “development” include the development in quality in addition to the growth in quantity, and that sustainable development wherein both the protection of environment and the economy are achieved, might be the development without the growth, or, in other words, it might be the improvement in the quality of the economic society while keeping the size constant without the growth in quantity.

The idea, that there is a positive correlation between the economic growth and the carbon dioxide emissions from human activities, is shared by, for example, Itou (2005) and Oka (2006)<sup>5</sup>. Itou takes serious the bad influences caused by the carbon dioxide discharged from human activities, and he suggests that economic growth should be restrained in order to decrease the carbon dioxide emissions. It is important to have it in mind, however, that “economic development”, as the improvement of the quality of the society, is admitted here.

## **2.3. The indices with which to measure “the economic development”**

What is increased when we call the change as “the economic development without the economic growth” or, more simply, “the economic development”? No indices, which indicate the improvement of the quality of the society, are mentioned in the writings of Itou and Uchiyama. Therefore, this study concentrates on the index of social well-being rather than the GDP or the GDP per capita as the tool by which to measure “the economic development”. The way, which is mentioned in Dasgupta (2001), to measure human well-being is one of the examples of these indices. “The indices to measure how good the lives are”, that are mentioned in Okabe (2012),

are also some examples of these indices. After the brief explanation of the advantages and disadvantages of the GDP<sup>6</sup>, Okabe (2012, pp. 3-4) says that the actions taken to overcome the disadvantages of the GDP has encouraged the development of the alternative indices during the last decade (especially during the last 2 or 3 years), and that there are two main streams among these activities. According to his explanation, one of the streams is the idea of taking the individual situation rather than the national situation into account, or the idea built upon the individualism, which has two directions of thinking, (I) the idea to take into account the size of the achievement per capita, instead of per nation, of the national economic activity, and (II) the idea to evaluate the situation of the economy or society including the elements that the GDP is unable to evaluate. One of the examples of (I) is the GDP per capita. The second idea (II) contains two approaches. One is (A) the approach to evaluate the economy by the stocks that generate the flow of welfare/well-being such as the GDP, and the other is (B) the approach of considering the happiness of people in the nation from not only the economic aspects but also the various other aspects that are related to human happiness. One of the examples of (A) is the approach of the Inclusive Wealth of the United Nations, while (B) includes, for example, the Human Development Index, which was developed by the United Nations in order to measure the improvement of human ability and the environment surrounding human lives, the Gross National Happiness, which was developed by the Kingdom of Bhutan and has become rapidly famous over these last several years, and the Better Life Index, which has recently been developed by OECD<sup>7</sup> with the assistance of Nobel Prize winners.

#### **2.4. Placement of Dasgupta (2001) in the context of this study**

Okabe (2012) explained the advantages and disadvantages of each index. According to figure 3 in Okabe (2012, p. 7), high Japanese economic rankings in the world, especially 3rd in GDP and 1st in the Inclusive Wealth per capita, attract attention. As is mentioned above, the GDP is “not” free from the problems. Therefore this study takes the Inclusive Wealth Index (written as IWI in the following part)<sup>8</sup> as the index to indicate “the economic development” into account, for the IWI is the index to evaluate human lives by paying attention to the natural environment and sustainability. The IWI was introduced in UNEP<sup>9</sup> and UNU-IHDP<sup>10</sup> (2012). The science advisor of the Inclusive Wealth Report 2012 (written as IWR in the following part) is Partha Dasgupta, the author of Dasgupta (2001) who explains the ways to measure social well-being as the basic ideas of IWR.

Actually, Sato (2013) criticized IWI because there are 4 major problems related to IWI. First, (1) the value of the property of the ecosystem, which generates the services of ecosystem, was not included as the item of IWR. Second, (2) although IWR admitted that there are limits of substitution between each capital, the critical nature of critical natural capital<sup>11</sup> was not reflected explicitly on the account of IWI. Next, (3) when there is an excessive exploitation risk by open access, or when public goods-like ecosystem services are lost by exploitation of

resources, all the countries as consumers of these resources do not compensate for the exact value of these natural resources which the exporting countries lose by exporting them. Finally, (4) considering the poor and most vulnerable people, it is not desirable to use market price in IWI because it disregards distribution characteristics of the society, but it is the second best way to select capitals included in IWI intentionally in order to include into wealth preferentially such capitals as improve the potential ability of people, and as bring critical effects on human well-being when they are lost. In order to prepare to overcome these limits of effectiveness of IWI in the future, this study investigates such precedent studies, for example Dasgupta (2001), as are effective tools in order to understand IWR and also in order to investigate the Inclusive Wealth itself, both as examples of the newest academic achievements, from a basic point of view.

### **3. An explanation on the extraction of the Behavioral Principle PD**

As is mentioned above, this study concentrates on Dasgupta (2001). In this section, the process of the extraction of the Behavioral Principle PD is explained. The Behavioral Principle PD is not strictly the idea of Dasgupta, and Dasgupta himself does not state anything concretely about the Behavioral Principle PD but only deplores about the status quo. This study rearranges the expression of deploring to replace it with a proposal of the solution of the problem on facts and values by using an active expression. The following list of cited sentences is the result of the investigation of the writings in Dasgupta (2001, pp. 3-7).

- I. "... the two<sup>12</sup> filter their perceptions of the way the world works through their distinctive ethical receptors – possibly, too, their distinctive personal interests." (Dasgupta, 2001, p. 6)
- II. "It seems to me that disagreement on ethics stems more from our lack of understanding of the ways socio-economic and ecological systems respond to policy than from fundamental differences in ethical thinking." (Dasgupta, 2001, p. 5)
- III. "... perhaps deep down it is the anti-Nazi's value with which the Nazi disagrees, ... But even if they cloak their real differences by arguing about facts, it is facts they argue about ..." (Dasgupta, 2001, p. 6)
- IV. "we are all still woefully ignorant of the ways in which human societies and the natural environment respond to policies." (Dasgupta, 2001, pp. 6-7)
- V. "In all my encounters with people from widely differing cultural and occupational backgrounds, I have observed few differences in the way redress, fairness, obligation, and reciprocity are understood. Evolutionary biologists explain this core commonality in terms of the kinds of problems we humans and our ancestors have faced and tried to solve over hundreds of millennia. Our capacity to have such feelings as shame, affection, anger, approval, and jealousy has emerged under selection pressure." (Dasgupta, 2001, p. 4)

The sharing of the cognition of facts, which would be achieved if the values were not dealt with as the issue, were left incomplete in I, II, and III, while IV shows our fatal shortage of the cognition of facts. And the core commonality is explained in V. This study defines the core commonality as a kind of human capital that is crucial for people to live on, such as our capacity to have such feelings as shame, affection, anger, approval, and jealousy, and the ability to understand redress, fairness, obligation, and reciprocity. Dasgupta explains that the core commonality is shared among all the people because, according to the evolutionary biologists, it has emerged under the selection pressure.

The expression “woefully” in IV shows the disappointment at our deplorable lack of cognition of facts. To put the expression “woefully ignorant” differently, however, it can be taken such that the cognition of facts would be deeper (but it is not so now). Additionally, I ~ IV indicate that many problems would be solved because the core commonality makes the aims of actions similar if the achievement of the agreement is taken into account without minding the difference of values when there is a gap in the cognition of facts. So the Behavioral Principle PD, “When there is a conflict about the cognition of facts of a problem, if we are not concerned about the different values and instead concentrate on sharing the cognition of facts preferentially, it leads people to make similar decisions of action and to cooperate to solve the many unsolved problems, because the core commonality lets people have similar aims of actions and act similarly”, can be derived. The characteristics of the model of “Facts and Values” of Dasgupta are enumerated as follows.

- 1) The values are the knowledge working as measures in the mechanism of value judgments.
- 2) It is postulated that there is a core commonality in the respective human mind, and this core of each person generates the aims of actions in response to the cognition of facts.
- 3) It is postulated that the core commonality generates similar aims of action in response to the similar cognition of facts.
- 4) It is postulated that, if the cognition of facts are similar, the aim of actions is similar through the mechanism of 3), and the decision-makings in response to the similar cognition of facts are also similar.

Putnam and Walsh (2007) do not comprehend the characteristics of the model of “Facts and Values” of Dasgupta as was mentioned above, and they seem to understand Dasgupta’s writings on the basis of the idea that it is indispensable in order to agree on the decision-making of the actions to agree on the values<sup>13</sup>. So Putnam and Walsh miscommunicated with Dasgupta in the series of discussions to prove that their criticism against him missed the point.

What differences are caused by the assumption of the existence of core commonality? If we think, like Putnam and Walsh, that human minds are completely different from each other

and there is no core commonality among people, we have to overcome every kind of difference of values whenever we try to make an agreement. If we assume that changing values tends to be very difficult for people because values directly relate to what they feel desirable/undesirable, it is also very hard to reach an agreement for people with completely different values. If we assume, however, the existence of the core commonality, especially as far as the serious problems related to our survival are concerned, people can reach an agreement easier by sharing the cognition of facts even though they have different values, because the core commonality makes similar actions in response to the same cognition of especially crucial facts for their lives.

#### **4. One of the limits of the Behavioral Principle PD: How to deal with various values**

##### **4.1. The difficulty to overcome the diversity of values**

In this section, the difficulty to overcome the diversity of values to share the important facts, as is one of the limits of the effectiveness of the Behavioral Principle PD, is introduced. Imagine the difference of the values between the Nazi and the Anti-Nazi, which is also referred to in Dasgupta (2001). Assume that the Nazi and the Anti-Nazi live their lives in the same community, and that they all share the same main experiences with each other. This enables them to form similar cognition of facts when they catch the same signal from the outer world. On the contrary, it can be assumed that the Nazi and the Anti-Nazi have completely different values, and that they filter the cognition of facts completely differently.

Next imagine the following situation. A Jewish person is a loan shark, most of whose customers are German people. He makes friends with many various people in everyday life. He is also eager to attend the volunteer works and philanthropic activities in his residence. One day, a Nazi police arrests him for obstruction of performance of official duty. How do the Nazi and the Anti-Nazi think about him? The Nazi looks the Jewish person as the bad loan shark who has done harm to many German people because they filter the cognition of facts with their own values, while the Anti-Nazi think that the Jewish person is in danger because of the unfair administration of the Nazi since they also filter the cognition of facts as their values want. There are conflicts in both facts and values.

What will happen if they share all of the cognition of facts about the Jewish person? If the Behavioral Principle PD is valid, the core commonality of their mind may enable them to form the better agreement about the treatment of the Jewish person than before. But unfortunately, the Behavioral Principle PD tells us nothing about how to overcome such kind of conflicts between different values. It proves to be one of the limits of the effectiveness of the Behavioral Principle PD.



## **4.2. Value judgments**

As is mentioned above, the question, “How can the sharing of the cognitions of facts be achieved against the situation wherein different values of people filter their perceptions differently?” is left unsolved. In this study, a value is assumed such knowledge as works in the value judgment as a measure of judgment. Value judgments are such actions as assigns respective cognitions of facts the priorities and filter the cognitions according to their priorities referring to values. In this situation, different values lead to different ways of value judgment, and tend to form different cognitions of facts. Then it may be desirable to skip such value judgments as are influenced by various individual values in order to share the important cognitions of facts among many people possessed with different values. If we can skip value judgment filtering some specific kinds of cognitions of facts, however, it means that we have no way to manage the formation of some kinds of cognition of facts, and this may bring us overflow of information into our mind. So we have to have such a way as regulates the flow of information about the cognitions of facts, and this is the very value judgment. It means that we cannot skip value judgments when we form cognitions of facts in our mind because we are assumed to have limited capacity to think, memorize and remember.

It is proved that we have to remake a part of the process of our value judgment or our values, if we want to keep important cognitions of facts from being filtered through various individual values. It is very hard, however, to change values of other people by the action made by the other people because values tend to be difficult to change without uneasiness, stress or emotional reactions.

## **5. Another limit of the Behavioral Principle PD: Money as the strongest determinant of individual well-being**

### **5.1. A model of society in the farm village A**

Dasgupta (2001, pp.46-50) considered the importance of education in the farm villages in the poor countries. Because even the primary educations are exotic goods for many people in such poor region, considering the way to supply education is meaningful to overcome poverty. The following example is a model of a firm village in such a rich country, for instance Japan, as is not considered in Dasgupta (2001). This study proves that we can find relating issues over “Cognition of Facts” and “Values” even in the rich countries. First, a model of a firm village in Japan as an application of Dasgupta’s way of measuring human well-being is introduced.

Imagine the model of society in the Farm Village A in the mountains in Japan as an example. There are few old people with fewer younger people and, needless to say, fewer children in village A. The main industry there is the paddy agriculture, which brings little earnings to the households. The global climate change generated from the emission of carbon dioxide from human activities is postulated to change the cycles of the change of temperature in this village

as well as the amount of rainfall, and to exacerbate these changes.

Let us now introduce the genuine investment<sup>14</sup> of village A. First, the human capital is being decreased. The human capital is accumulated through, for example, the education, the training, or the investment in the skills. In the village A, however, most people are so old that the investments in the human capital are limited. Taking the consumption of the fixed capital, or the death of citizens, into account, it would be possible to assume that the genuine investment in the human capital is negative in this village. Second, the accumulation of the public knowledge is very slow because there are not any research institutions that directly contribute to improving the lives of people in this village. Taking the consumption of the fixed capital, or the death of the citizens, into account, it would be possible to assume that the genuine investment in the public knowledge is also negative in this village. Third, the productive power of the village A is so weak that the investments in the manufactured capital are not active. So taking the consumption of the fixed capital into account, it would be possible to assume that the genuine investment in the manufactured capital is also negative in village A. Finally, as far as the natural capital is concerned, the amount of this capital cannot be increased because the power to manage and control the natural environment becomes weaker under the situation wherein the human capital, the public knowledge, and the manufactured capital become worse. This situation causes the bad phenomena that the ability to generate the flow of well-being becomes weaker, which leads to increase the accounting price of the natural capital, as is the quantity of the well-being decreased if very little natural capital is decreased. When it comes down to it, the productive base in village A, as the accumulation of the four kinds of capitals mentioned above, is being decreased. So the genuine investment in the natural capital in village A, as is the quantity of the product of the change of the quantity of the natural capital and the accounting price, is negative, and this proves village A to be one of the villages confronted with extinction. Such a village is called as “Genkai-Shuuraku” in Japan.

Next the global climate change also has deleterious influences on village A, which is already confronted with extinction. Firstly, global climate change changes the quality of the natural capital that leads to a mismatch between the existing technologies and the natural environment, and the harvest of the rice produced by the existing technology is decreased. Secondly, village A, without enough power to make trial and error to solve the problems, cannot achieve any innovation to overcome the mismatch between the productive bases. Finally, the rice produced in the village A cannot be purchased by consumers in a competitive market because its quality is not so good, which further decreases the income of the households in village A.

It is also worth taking into account that global climate change brings, for example, heavy snow, floods, typhoons, droughts and so on to village A and destroys the productive bases. Basically because village A follows the tendency to decline and is confronted with extinction, people there cannot earn enough money by themselves by selling something produced there in order to reconstruct the social functions to overcome the damage from the disasters by their

own efforts, unless outsiders give them some humanitarian aid.

## **5.2. Money and the harmony between the individual citizens and the society**

Let us see an example of the limit of effectiveness of Behavioral Principle PD caused by one of other reasons than the diversity of values. Farmer Q is a young person who lives in village A. He has already learned about the global climate change issue at school and knows that global climate change does not necessarily cause the increase of the temperature in the village. Farmer Q seeks to increase his income through selling rice at as high a price as possible, and is willing to use, for example, the machines that work by burning fossil fuels, chemical fertilizers and insecticides. And he wants to move to the city after he saves enough money. Farmer Q holds enough cognition of facts concerning the issues in village A. The actions of farmer Q, however, are incompatible with the level of his understandings on the issues in village A because his actions damage the sustainability of the natural environment and the community there over a long period of time.

Money is the strongest determinant of human well-being in this sufficiently mature market economy, and citizens there try to optimize their income. Farmer Q is one of the players in this highly mature market economy whereby he can buy almost everything he wants and/or needs in his everyday life from the market. The sharing of only the cognition of facts of the destruction of the natural environment might never changes the shortsighted actions, because earning money is the critical task for them in the competitive market economy wherein the loss of the chance of earning money means the loss of the human well-being, or the loss of the chance to survive. In such a society, they take more important to earn money to survive every short period of time than to keep natural environment from a long-term point of view. In other words, the core commonality of farmer Q is occupied by the aims to earn money because money is so important to survive there that money is prior to other things. If there are no inheritance taxes, he tries to save money as much as possible because money enables his children to take advantage in the market economy. Even if there is a inheritance tax, however, if education is supplied through market, and if the more money he pays the more human capital he or his family-members can accumulate, farmer Q also tries to gain more money.

The limits of the effectiveness of the Behavioral Principle PD show that the shortsighted optimization of income through using the exhaustible resources, such as “the tragedy of the commons”<sup>15</sup>, can occur. Many people might mistakenly think they can get alternative services as long as they have enough money even if they earn this money by destroying the natural environment without any alternatives, because the natural environment belongs to the market externality, and so, many people cannot know the real magnitudes of damages they made towards the natural environment. Additionally, even if people mistakenly think that the damage made by individual person makes is so small, the accumulation of such damages can destroy the global eco-system. Actually, sharing cognition of facts may solve such problems. It is

another problem left to be unsolved, however, that farmer Q would still choose the actions to optimize his own individual income at the cost of the social well-being even after sharing cognition of important facts, if the situation is like a Nash equilibrium<sup>16</sup> wherein farmer Q's isolated change of shortsighted actions never generates his own benefit.

It is also true that nobody is willing to agree to the redistribution of money or that of the ability to earn money if the competition to get money or ability to do so in the concerned society is so hard. Even if these policies can protect global commons and help many poor people, richer people might want to use money only for themselves, because they might believe that the curtailments caused by the competition in the market are so common and mundane that it is not necessary to rescue the victims of market competition, or because they think that it is none of their business.

## **6. Conclusion**

This study investigated "Facts and Values" in Dasgupta (2001) because it is worth considering under the situation wherein all the people on the earth face the harms of the drastic change of the state of affairs caused by global climate change. The Behavioral Principle PD led from the writings of Dasgupta (2001) tells us the importance of the preferential sharing of cognition of facts in order to agree and cooperate. This study simultaneously found some limits of effectiveness of the Behavioral Principle PD. The way to overcome the difference of values to share the important cognition of facts should be devised in order to mitigate the limits of effectiveness of the Behavioral Principle PD. How to distribute enough human capital that enables people to choose better actions to improve sustainability that simultaneously enable them to earn enough money, or how to settle better institutions that compensate for remedies of competitive market economy are other biggest problems to be solved by other studies.

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## **Note**

<sup>1</sup> P and D are initials of Partha Dasgupta.

<sup>2</sup> The Behavioral Principle PD does not promise achievements of every kind of agreements, but it may contribute to construct certain kinds of agreements.

<sup>3</sup> According to Uchiyama (2009, pp. 167-168), the environmental Kuznets curve hypothesis is generated from the facts observed. In a country, the curve showing the relation between the quantitative increase of the income per capita and the qualitative improvement of the level of pollution is a reverse U-shaped curve, which is called the environmental Kuznets curve. In other words, the environmental burden is increased in the earlier stage of the economic development, and it is decreased after the income per capita becomes more than the turning point.

<sup>4</sup> Uchiyama (2009, pp. 174-176) investigates the prior research and shows the results of the major studies in figure 5-1 in his article. He explains that the studies that analyzed periods ending after the year 1995 clarified that the EKC's of carbon dioxide are the reverse U-shaped curves. Additionally, he says many of the latter studies show that the income levels of the turning points of the EKC's are from about \$15,000 to about \$30,000. He adds that, some research concludes that, even if the validity of the EKC's is clarified

in a certain country, it cannot be clarified for the world. He also mentions that there are some studies that conclude that the results with the whole sample are different from the results with the subsamples; for instance, the sample which contains only the developed countries, the sample which includes only the developing countries, and so on.

<sup>5</sup> “The economy introduced by Itou wherein people are not required to achieve economic growth” is written in Oka (2006, p. 294). Oka cites many writings of Itou.

<sup>6</sup> According to Okabe (2012, p. 2), the advantages of the GDP are; firstly, the objective evaluation of the values of goods and services by using the market prices; secondly, the availability of the comparisons between different countries, and so on, while the disadvantages are; firstly, the lack of considerations of the things that are not traded through the market; secondly, the lack of the consideration of the stocks that are measurable when they are there, because the GDP is the index of the flow of the value of products produced during a certain fixed period; thirdly, the GDP cannot at all clarify the distribution of the outcomes from the economic activities among the people in the considered country; finally, it is such a basic problem as it is impossible to evaluate the levels of the lives of people only by the calculations of the economic data. So it is desirable to take into consideration the indices that are not based on the monetary factors or the market factors, for example such indices as the health, the subjective happiness, the individual security, the social relations between people, and so on.

<sup>7</sup> Organization for Economic Cooperation and Development

<sup>8</sup> Let  $K_i(t)$  be the stock of asset  $i$  at time  $t$ ,  $P_i(t)$  be the shadow price of asset  $i$  at time  $t$ , and  $Q(t)$  be the shadow price of asset time. If  $W(t)$  denotes Inclusive Wealth at  $t$ , we have:

$$W(t) = Q(t)t + \sum_i P_i(t) K_i(t)$$

Inclusive Wealth has the same structure as wealth in Dasgupta (2001). See the note No.14.

<sup>9</sup> United Nations Environment Programme

<sup>10</sup> UNU means the United Nations University and IHDP means International Human Dimensions Programme on Global Environmental Change.

<sup>11</sup> Although Sato (2013, pp. 19-20) seemingly cited the word “critical natural capital” from Pearce (1994), this word appears only a few times in the title of a section and the conclusion in Pearce (1994, p. 457-474) without clear definition. Sato explains critical natural capital as such natural capital under the prerequisite of strong sustainability wherein human capital is unable to substitute such natural capital, and the less quantity of such natural capital than certain quantity of it may cause the irreversible destruction of bio-system.

<sup>12</sup> This means “the Nazi and the Anti-Nazi”.

<sup>13</sup> There are no clear writings showing their understandings in Putnam and Walsh (2007). However, the question, “But is that enough to constitute ‘agreement on values?’” shows that Putnam and Walsh (2007, p.185) think the formation of agreement on the values is important. On the contrary, Dasgupta does not take the agreement in values into account, and the sharing of the cognition of facts enables people to resemble each other in the aims of actions and the choices of actions because of the existence of the core commonality. Therefore Putnam and Walsh do not understand the structure of the model of facts and values of Dasgupta correctly, and this misunderstanding leads their criticisms to miss the point.

<sup>14</sup> Shortly speaking, Dasgupta (2001) explains the genuine investment as follows. At the date  $t$ , denote  $K_{it}$  as the quantity of the  $i^{\text{th}}$  human capital,  $H_{jt}$  as the quantity of the  $j^{\text{th}}$  manufactured capital,  $S_{kt}$  as the quantity of the  $k^{\text{th}}$  natural capital, and  $Z_{mt}$  as the stock of the  $m^{\text{th}}$  kind of the knowledge. Next, let well-being at  $t$  ( $V_t$ ) be the unit of account, and let  $p_{it}$ ,  $h_{jt}$ ,  $r_{kt}$ , and  $q_{mt}$ , respectively, denote its accounting price. They are the spot prices. The economy’s wealth at  $t$  can then be expressed as

$$W_t = \sum_i (p_{it} K_{it}) + \sum_j (h_{jt} H_{jt}) + \sum_k (r_{kt} S_{kt}) + \sum_m (q_{mt} Z_{mt})$$

The notion of wealth advanced here is a comprehensive one, and is the social worth of an economy’s entire capital base. The wealth has the merit of being linear in assets, the accounting price of an asset being the weight awarded to a unit of the asset. A country’s wealth in a given period is its wealth in the

previous period plus the net investment that was made during the previous period. The wealth increases if, and only if, there is the net investment in the capital base. This is formularized by the next formula.

$$I_t = \sum_i (p_i dK_{it} / dt) + \sum_j (h_{jt} dH_{jt} / dt) + \sum_k (r_{kt} dS_{kt} / dt) + \sum_m (q_{mt} dZ_{mt} / dt)$$

Let it be called the genuine investment. It is the social worth of the change of the capital base at  $t$ . It measures the change in the wealth at  $t$  in the spot price.

<sup>15</sup> “The tragedy of the commons” is explained in Dasgupta (2001, p. 108) as follows. “It is convenient to classify externalities into two categories: unidirectional and reciprocal. Damage inflicted by upstream deforestation on downstream farmers without compensation is an example of the former. The famous ‘tragedy of the commons’ is a metaphor for the latter. Carbon emissions into the atmosphere is one example of the tragedy; other examples are unregulated fishing in the open sea and groundwater withdrawal under free access.”

<sup>16</sup> “A Nash equilibrium” is explained in Jehle and Reny (2011, p. 173) as follows. “In a Nash equilibrium, every agent must be doing the very best he or she can, given the actions of all other agents. It is easy to see that when all agents have reached such a point, none has any incentive to change unilaterally what he or she is doing, so the situation is sensibly viewed as an equilibrium.”

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