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T1 _____	**1916129**	F1 _____
T2 _____		F2 _____
T3 _____	Problem Chosen	F3 _____
T4 _____	**E**	F4 _____

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Summary Sheet

To evaluate the unmeasurable cost of environmental services, our team introduces an accounting model to calculate the economic costs of ecosystem services. We divide the true economic costs of land use projects into three parts: natural resource consumption, cost of environmental pollution and cost of environmental degradation.

To measure the **natural resource consumption** more accurately, we discuss the non-market consumption and market consumption separately. For the non-market consumption, we express it with the ecological value of the natural resource we put in. For market consumption, we express it with the shadow price of the net primary production (NPP), which can be calculated by CASA model.

When it comes to **cost of environmental pollution**, we divide the environmental pollution into water pollution, air pollution and industrial waste. Then we consider the derivative effect of pollution by calculating the economic loss it causes.

As for the **cost of environmental degradation**, we divide it into the cost of vegetation depletion, land degradation and biodiversity decrease. We introduce the concept of ecological value to measure the cost of vegetation depletion, while the cost of land degradation is measured by its opportunity cost. Then we introduce Shannon Wiener Index to measure the biodiversity decrease.

To calculate the environmental degradation **cost** of land use projects, we regard the self-recovery process of ecosystem as a negative feedback process based on the feedback principle of BP nerve network. Then we construct a long-term ecological self-recover model. In order to weight different factors' influence more accurately, we develop an **OBP (One-way back propagation) nerve network**, which is significantly simplified from the well-known BP nerve network. Firstly, we train the known data in the net without considering environmental recovery. After obtaining the weight of each factor, we use it in the **long-term ecological self-recover model** and calculate the cost of environmental degradation.

Then we cite three typical cases to conduct the **cost-benefit analysis**, which are House, Subway and Steel Mill. After our cost-benefit analysis, the House is not worth building considering the cost of ecosystem services, while it is worth building in the traditional analysis model. The Subway and Steel Mill is worth constructing in both the traditional way and our new model. From the cases, we can see the significance of considering the cost of ecosystem services for it may influence the decision of planners.

At the end of the paper, we have a further discussion about the cost of ecosystem services. We put forward an innovative expression of **Green GDP** with the model we built. Moreover, to relieve the externalities of land use projects, we consider **Pigou tax** and define it in a new way.

Key Words: ecological value, BP nerve network, long-term ecological self-rec ost-benefit analysis, Green GDP, externalities

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