To elucidate how soil microbes and nematodes are involved in the phenomena in agricultural fields, such as crop growth, pest infestation and suppressiveness, we need to collect the information of soil biota, and compare it across soil samples. However, our knowledge on the soil biological properties is still far from enough to evaluate them for soil management. This is mainly because of lack of appropriate methods for examining soil microbial population, major of which cannot be cultivated with conventional methods. In 2006, Ministry of Agriculture, Forestry and Fisheries of Japan started a project addressing development of analysis methods for soil biological properties using environmental DNA (eDNA) which is extracted from soil. It united researchers of national institutes, universities and prefectural agricultural experiment stations in Japan. The outline of the project and some achievements obtained will be introduced. The project consists of three subthemes. In the subtheme 1, we have optimized and standardized the conditions for PCR-DGGE using soil eDNA to compare the microbial communities in different soil samples. We determined the most suitable primer sets and "DGGE markers" for each of soil bacterial, fungal and nematode analysis and optimized conditions in PCR amplification, electrophoresis and other experimental steps. In this subtheme, we also construct an RNA extraction method from soil with high purity to analyze functions of soil microbes such as nitrification or denitrification activities etc. The subtheme 2 aims to develop analytical methods for elucidation of relationship between soil biodiversity and crop productivity. We have been collecting soil samples under various types of agricultural management at different localities from the northern to the southern Japan, and analyzing the eDNA extracted from each soil sample by the standardized PCR-DGGE method. The subtheme 3 have been constructing a database (eDDASs, eDNA database for agricultural soils) collecting the results of soil eDNA analysis accompanying the physical and chemical soil properties with information about crop productivity in each agricultural fields. This database also provides some tools for data retrieval and analysis developed by this project and others. Applications of new analytical methods using microarray or metagenomic approach are also considered in this project. We expect to elucidate the mechanisms in which soil biota affect agricultural production, by analyzing the biological information revealed in our project. Our final goal is to determine the relationships between the biological properties evaluated by eDNA or RNA analysis and the soil physicochemical properties as affected by cultivation practice.