Discussion on Plants of Soil and Water Conservation Research in Jiangxi Province

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Abstract. The configuration of plants of soil and water conservation resources is an important "source" and "sink" of ecological construction. Plants of soil and water conservation are of great significance for the control of soil erosion. However, in the practice of comprehensive management of soil and water conservation in Jiangxi Province, the selection range of plant resources for soil and water conservation is limited, and the plant varieties are not abundant. Therefore, it is one of the important ways to enrich the resource base of plants of soil and water conservation and improve the ecological environment of red erosion area in Jiangxi Province to screen out plants of soil and water conservation and corresponding configuration models with development value for Jiangxi Province and evaluate the benefits of plants of soil and water conservation configuration model in typical project areas.

1. Introduction
The configuration of plants of soil and water conservation resources is an important "source" and "sink" of ecological construction. However, there are relatively few studies on the application and configuration of plants of soil and water conservation in Jiangxi Province, and the types of plants of soil and water conservation used in the project are relatively limited. A large number of native plants have not been fully used, not only the material is not targeted, but more difficult to reflect the local regional characteristics. Therefore, on the basis of the investigation of plants of soil and water conservation in Jiangxi Province, the following points are making an important role on helping to accelerate the construction of ecological civilization of soil and water conservation in Jiangxi Province: to make sure the excellent species of plants of soil and water conservation are selected; to establish a catalogue of plants of soil and water conservation and the resources utilization-spectrum in Jiangxi Province; to discuss the suitable plant configuration mode of soil and water conservation; and to evaluate the benefits of plant configuration mode of soil and water conservation in typical project areas.

2. Research overview
Soil erosion control is an important aspect of ecological construction. The main measures to control
soil erosion include engineering measures and plant measures, among which plant measures are the more fundamental measures[1]. After the configuration of plants of soil and water conservation resources in the soil erosion area, a more complete plant community structure can be gradually formed: the well-proportioned distribution of canopy, litter layer composed of trees, crowns, and grasses in the above-ground part, as well as the root layer of intertwined roots in the underground soil, can intercept precipitation in layers, resist rainfall splash erosion and runoff scouring, and consolidate the soil from erosion. In the long life cycle of plants, through their self-organization ability, they constantly adapt to the changing environment and develop community succession, which always occupy, transform and protect the ecological environment, forming a beautiful landscape of "green hills are always here, green water is flowing"[2].

Jiangxi Province is 620 km long from north to south and 490 km wide from east to west, with a total land area of 166,900 km². In Jiangxi Province, mountains and hills are undulating, basins and valleys are widely distributed, and the topography and landform are complex. Soil and water loss is relatively serious, which is characterized by large area and wide range. Due to the long-term soil erosion, the ecological environment is affected. The sparse vegetation and serious soil erosion affect the natural recovery of vegetation, which seriously restricts the sustainable development of the local ecological environment, and has become an urgent environmental problem needing to be solved.

According to the results of the first national water conservancy survey—special survey of soil and water conservation in Jiangxi Province, among the eight provinces in the southern red soil region, the area of soil and water loss in Jiangxi Province is second only to Hubei Province and Hunan Province, and the proportion of soil and water loss area to the total land area is second only to Hubei Province. The area of soil and water loss above the intensity level is 4,000km², which ranks the 3rd among the 8 provinces in the southern red soil region[3]. Land degradation, reservoir sedimentation, riverbed uplift, and increased flood and drought disasters, etc. have threatened food, flood control, ecology, and the safety of human settlements, which has become a limiting factor in the sustainable development of social economy in Jiangxi Province[4]. Therefore, accelerating the management of soil erosion areas is of great significance to economic and social development.

Based on the causes and characteristics of soil and water loss, soil and water conservation workers have done some basic research works on the optimization of plant species, optimal configuration of plant measures, plant community distribution and soil and water conservation efficiency of plant measures. For example, Xian-Kun LI, et al. carried out an experimental study on ecological restoration in key areas of soil and water loss in Guangxi, selected excellent plants for soil and water conservation and studied the ways of ecological restoration and reconstruction in granite eroded areas[5]. Bao-Ping XIE and De-Kui NIU conducted a study on the species composition, structural characteristics and distribution characteristics of the plant community in the red soil erosion area of South Jiangxi, and the vegetation types and soil physical and chemical properties of the existing stages in the collapse mound erosion area in the south China[6~7]. Yan-Sheng YANG summed up the plant community combination series that can realize biodiversity in the greening practice of soil and water conservation slope in the quaternary red clay soil erosion area[8]. In order to determine the type of forest and grass vegetation suitable for weathered granite area in Yichang, Hubei, Li-Hua CHEN quantitatively analyzed and evaluated the soil improvement of forest and grass vegetation using principal component method[9]. In the red soil erosion area of granite area in Changting County, Fujian Province, Yu-Sheng YANG, et al. studied the soil chemical properties, soil microorganisms, soil enzyme activities and soil respiration of four different management modes, namely, engineering grass planting, engineering fruit tree, sparse forest replanting and closed forest afforestation[10]. Zhao-Yan WANG, et al. carried out positioning experiment on 10 herbaceous plants in Quaternary red soil erosion area, observed relevant indexes, screened and evaluated them by AHP and fuzzy mathematics method, and selected 7 herbaceous plants for popularization[11]. Jian-Hong BAI selected indicators from the aspects of ecological adaptability, soil and water conservation benefits, economic benefits and planting costs to construct an index system for screening and adaptability evaluation of ridge plants. He comprehensively evaluated more than 50 kinds of wild native species, local cultivated species and
introduced species in Northeast China, and selected 8 suitable plants for soil and water conservation in the black soil area of Northeast China[12]. GANG ZHOU studied the species selection and configuration mode of soil and water conservation forest in Hunan Province by measuring the association of dominant population in the representative community types of natural secondary forest in Hunan Province, which provided practical technology for the construction of soil and water conservation forest in Hunan Province[13]. These studies and practices have played a certain role in guiding the prevention and control of soil erosion, maintaining and improving land productivity.

Figure 1 Xiaobuyan ecological tea garden in goudaozui ecological clean small watershed, Xiaobu Town, Ningdu County, Jiangxi Province, China

Figure 2 Xiaobuyan ecological tea garden in goudaozui ecological clean small watershed, Xiaobu Town, Ningdu County, Jiangxi Province, China
Secondly, with the deepening of the research in all aspects of plant science, there are more and more information related to plants. How to summarize and sort out the existing plant data and construct a plant list that is easy to query and operate, so as to provide detailed and effective information for plant researchers and management decision makers, which is of great significance for the research of plant science. At present, some scholars have carried out research work on the list of plants, mainly concentrated on the list of functional plants[14], the list of ferns[15], the list of C4 plants[16], and the list of plants on a regional scale[17]; and the establishment of plant information system and database with a view to the management and utilization of plant resources. However, the research results on the classification and arrangement of plant resources for soil and water conservation are still relatively scarce. The establishment of the list of plants of soil and water conservation in Jiangxi Province will have high practical value, especially for the study of plant diversity, the development and utilization of efficient local plant resources and the construction of ecological environment in Jiangxi Province, which will be an important guide for academic exchanges, scientific research and teaching, and production and business activities. Accurate and comprehensive list of plant resources for soil and water conservation in Jiangxi Province is of great significance for the sustainable development and utilization of resources in Jiangxi Province.

3. Conclusion
To sum up, the basic experimental research on soil improvement of plants of soil and water conservation has been carried out, and positive progress has been made in the research of soil and water conservation efficiency, but the research on the theory and practice of plant selection and vegetation restoration in different regions is relatively weak and not deep enough. Vegetation restoration is an effective means to prevent and control soil erosion. Therefore, it is of great significance to improve vegetation coverage, prevent and control soil erosion and improve the ecological environment of erosion areas by starting with the selection and configuration of local plants in Jiangxi Province and evaluating the benefits of configuration mode of plants in typical project areas.

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