"Renlong Law" and Its Scientific Significance

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Abstract Based on application of "Renlong tillage technology" in 40 kinds of crops in 26 provinces of China, and saline alkali land and degraded grassland of 10 provinces in the past 10 years, "Renlong law" that Renlong depth of various land resources suitable for cultivation in reasonable depth interval and utilization degree of "natural resources" are proportional to increase in agricultural output, ecological environment improvement and increase in economic output is discussed in this paper. Moreover, its formula, 8 "effect laws" and their scientific significance are given. "Full-layer tillage" or "bottom-layer tillage" of Renlong "super deep ploughing, deep loosening and not disturbing soil layer" is expounded, and the way of multiple incremental utilization of "natural resources" is created, which could be applied in various land resources suitable for cultivation, and realizes deep utilization of natural resources in a "big explosion". Additionally, China has 147 million ha of cultivated land, saline alkali land and degraded grassland, and 400 million people can be supported by the newly increased grain and meat, etc. by Renlong, and 88 billion m³ of land water resources is added. "Renlong law" is proposed based on Renlong phenomenon, and it is conducive to deep enjoyment and protection of natural resources by human beings, and harmonious development between man and nature.

Key words Renlong law, Renlong effect, Formula of Renlong law, Natural resources, Tillage technology

1 Introduction "Renlong tillage technology" (1-4) is referred to as "Renlong", and is also called "deep rotary tillage technology" or "excellent tillage technology". It is a new tillage method created by Wei Benhui team from Guangxi Academy of Agricultural Sciences. Renlong constructs new technology of "super tillage layer" and "super soil reservoir" based on "full-layer tillage" or "bottom-layer tillage" of "super deep ploughing, deep loosenning and not disturbing soil layer". The most significant characteristic of "Renlong tillage" is "super deep ploughing, deep loosenning and not disturbing soil layer", which completely subverts the traditional tillage mode of ploughing and breaking soil by plough and shallow tillage layer. In the past 10 years, Renlong has been applied in 40 kinds of crops in 26 provinces and saline alkali land and degraded grassland in 10 provinces, and the effects of 10% - 50% of yield increase and more than 100% of natural rainfall storage increase were obtained without increasing fertilizer and water. There is major academic significance, application value and deep influence on the expansion of human living space. By merging ultra deep loose soil tillage with production potential of crop planting, Renlong could drive a new round of incremental utilization of "natural resources", and bring large incremental output of food and other agricultural products needed by human beings. Moreover, Renlong could decrease flood and drought by "natural force" generated by its huge "soil reservoir", and promote the ecological environment to become benign. "Renlong law" in Renlong phenomenon is expounded, which provides new theoretical and technical support for human beings further understanding and following nature, cultivating agricultural growth and a new pole of ecological civilization, global population growth and green development demand in the next millennium.

2 Basic scientific concepts of Renlong creating condition for "Renlong law"

2.1 Renlong following green development concept of "depending on natural resources", and belonging to "upgrade" of traditional tillage To the 1980s, the history of human survival and development was basically a history of "natural agriculture" based on natural resources. In recent decades, with the demand for food supply increased, to pursue the continuous improvement of unit production, improved variety and chemical fertilizer were used, which caused soil hardening and pollution of soil, water and gas, and sustainable and green development were seriously challenged. Renlong came out in this background. It should be mentioned that Renlong follows natural rules, creates the new concept of "human beings based on nature" that "people oriented" is compatible with "nature oriented", and abandons the current "chemical only" production mode in current agriculture. It is called "the fourth set of" tillage mode after the plough mode of manpower, animal power and tractor, and forms tillage technology system different from traditional tillage tools, methods, effects, and ranges. Even more gratifying, it could activate and use various land and space resources that have not been fully utilized by human beings, improve natural production capacity per unit area, broaden people's vision, break through the existing understanding of nature, especially agricultural natural resources, the scope of academic research and the thinking of agricultural production, and get rid of the environmental pollution type of production pattern that agriculture depends on chemical fertilizer and pesticide to in-
crease production. Thus a new technological "inflection point" is formed, and embarking on a new green development road of "depending on natural resources".

2.2 Fenlong following universal tillage idea without ecological region and crop limitation As new tillage member after the plough mode of manpower, animal power and tractor[5], Fenlong has been applied in Hainan and Guangxi (high latitude), Heilongjiang, Inner Mongolia and Xinjiang (low latitude), Tibet (high altitude), 40 kinds of agricultural crops in 10 years. Results showed that yield could be increased by 10% ~ 50% than the plough mode of traditional manpower, animal power and tractor[6]. It could be widely used in China and even in the world, and it is a kind of technology that can return to nature, activate and utilize natural resources, restrain the degradation of soil productivity, and promote the harmonious coexistence of human and nature.

3 Scientific essence and characteristics of Fenlong laying the foundation for "Fenlong law"  

3.1 The essence and characteristics of agriculture In history, "a hoe" and "a plow" have nurtured human beings to this day. The essence and characteristics of agriculture are following natural rules, loosening soil and using production potential of crop variety through farming according to human survival and development needs, driving utilization of soil nutrients, oxygen, water, temperature, natural precipitation, space precipitate, solar energy, etc., and changing into food and other agricultural products for human needs via crops.

3.2 The essence and characteristics of Fenlong The global population will grow from 7 billion to 10 billion, and the tillage mode of "one hoe" and "one plow" will be difficult to meet the future demand. Fenlong invents "spiral drill" and other deep rotary tillage tools, and is the new way of ploughing and breaking soil. Under the condition of "not disturbing soil layer", ultra deep ploughing and deep loosening for multiple times could be conducted, that is to say, it could deepen by 1~2 times than traditional tillage. Its essence and characteristic are that the cultivated soil is fine and is in suspension state, and the amount of loosen soil could increase by 100%~200%. At quality aspect, available nutrients, soil oxygen and soil temperature increase by 10%~30%, more than 1 times and 1~2°C[6~12]. These indicators of natural resources activation and utilization in soil greatly exceed traditional tillage mode. In crop planting, it could reduce fertilizer application and save irrigation water, and yield increase also could be conducted. If quantity and quality of traditional tillage mode are set as 2.0 version, Fenlong could be viewed as 3.0 or 4.0 version.

3.3 The essence and characteristics of Fenlong agriculture Fenlong could not only activate soil resources under the plough floor of existing cultivated land that have not been utilized but also expand to the use of various other land resources that have not been fully utilized, such as saline alkali land, degraded grassland, etc. The important essence and characteristic of Fenlong agriculture bring restoration and health of soil and environment, making people not only eat enough but also eat well and healthily, so as to keep sustainable development of agriculture. So to speak, Fenlong is permanent "true science" and "hard science" in agriculture. The essence and characteristic of Fenlong agriculture only change in tillage layer, but its deep-layer impact and wide crop and environmental adaptability make it far higher than tillage layer. It could study the derived influence of soil, water and space and its potential improvement, and even affect four dimensional area of human activity space, active soil microorganisms, optimize soil and atmospheric water cycle, further affecting human health and creating the well-being of future generations by improving plant quality.

4 The scientific theory of Fenlong providing support for "Fenlong law"  

4.1 Core scientific theory of Fenlong Core scientific theory of Fenlong is multiple incremental utilization of "natural resources" promoting the expansion of human survival and development space. The target of Fenlong science is to create multiple incremental utilization way of "natural resources" via unique tillage manner, cultivate agricultural growth and a new pole of ecological civilization, and make human beings more realize the target of "living depending on nature". Fenlong could affect crop yield and quality, water cycle of soil and atmosphere, construction of the earth biosphere by improving three dimensional structure of soil, thereby indirectly improving human health and benefiting future generations.

4.2 Several effect theories of Fenlong Based on unique tillage manner of Fenlong and multiple incremental utilization of "natural resources", Fenlong effect theories different from traditional agriculture and cultivation are as follows. (i) "Four-reservoir theory" of soil. Since loose soil increases, and soil quality is promoted, new soil nutrients, water, oxygen and microorganisms ("four reservoirs") are constructed, which is conducive to natural increase of crop yield. (ii) "Root-based theory" of crop cultivation. The root system is especially developed, with strong activity, and it solves "appetite" of nutrient absorption and utilization in crop growth cycle to the maximum degree. (iii) "Theory of balanced nutrition supply" of crop cultivation. Since "four reservoirs" are enlarged, balanced supply of nutrition in soil could be conducted in growth period of crop, making that the growth and development of crops are harmonious and robust. (iv) "Theory of strong resistance" of crop cultivation. Root system is especially developed, and it could decrease the impacts of drought, low temperature and high temperature to the maximum degree in growth period of crop, and the resistance to adverse natural environment increases, which is conducive to stable and high yield. (v) "Water surplus theory" of soil. Fenlong tillage soil is fine and deep, and "soil reservoir" could store water and absorb water in air at night, forming "water surplus effect of Fenlong soil", which could reduce irrigation water and is conducive to crop growth. The theo-
ry has major significance. (vi) "Salt dilution theory" of soil. The surface of aggregate structure of Fenlong soil is smooth, and the porosity is large. Capillary is easily to cut off, and salt in soil from top soil sinks and is not easy to move upward, thereby realizing "salt dilution". It has major practice significance for physical and low-cost transformation of saline alkali land.

5 Connotation, definition and scientific significance of "Fenlong law"

5.1 Theoretical basis of "Fenlong law" determined by "law" The "law" is objective law which has been proved by the practice and reflects development and change of things under certain conditions. Sir Isaac Newton proposed the most basic laws in the universe: law of universal gravitation and three laws of motion (law of inertia, acceleration law, law of force and reaction), and they were explained by mathematical method in the Mathematical Principles of Natural Philosophy issued on July 5, 1687. These four laws constitute an unified system, and it is regarded as the greatest achievement in the history of human intelligence. Thus, the scientific viewpoint of physics in the next three centuries was established, and it became the foundation of modern engineering. The scientific core of Fenlong tillage is high-quality "deep ploughing and loosening" without disturbing soil layer, and new "super tillage layer" and "super soil reservoir" are formed. It is important basis of transforming natural resources into food source required by the increased human, increasing water resources, decreasing flood and drought. Theoretic basis of "Fenlong law" is as below: based on the unique tillage manner of Fenlong, it could activate and use soil mineral nutrients, air oxygen, natural precipitation, and solar energy, which could greatly provide food source required by human beings. Compared with traditional tillage, Fenlong tillage has internal regular change in soil quantity and quality and utilization of other natural resources, with obvious law.

5.2 Support of scientific experiment results to "Fenlong law"

5.2.1 Support from yield increase rule by tillage mode in "5 000 years". In 2010, "5 000 years" of tillage mode experiment was implemented in Majiaotang Village, Zouwei Town, Binyang County, Guangxi; 12 cm of tillage depth by manpower, 15 cm of tillage depth by animal force, 20 cm of tillage depth by tractor and 40 cm of tillage depth by Fenlong. Corn and peanut were respectively planted, and they were managed under zero fertilization and rainfed condition. Corn yield by Fenlong tillage respectively increased by 13.36%, 15.08% and 18.59% than that by tractor, animal force and manpower. Peanut yield by Fenlong respectively increased by 17.91%, 23.76% and 27.21% than that by tractor, animal force and manpower. Evidently, crop yield increased with land tillage depth, and its yield per unit area was improved, in which yields of corn and peanut by Fenlong tillage for 40 cm increased by 13.36% and 17.91% than that by tractor tillage for 20 cm.

5.2.2 Support from yield increase rule by large-area and multi-crop application. In the past 10 years, Fenlong was applied in paddy field for 30 cm (thickening by 1 times traditional 15 – 18 cm) and dry land for 40 cm (thickening by 1 times traditional 12 – 20 cm) in 36 kinds of crops in 26 provinces in 18° – 46° N. Moreover, it could transform and use cultivated field (dry land and paddy field), saline alkali soil, degraded grassland and desertification land, increase yield by 10% – 50% (higher to 100%), such as yield increase of sweet potato by Peng Xinhua from Nanjing Soil Research Institute, Chinese Academy of Sciences, improve quality by 5%, hold water by 1 – 2 times, dilute salt by 20% – 40%, and improve ecology. "Fenlong bottom tillage" was firstly implemented in paddy field in Natong Town, Long’an County, Guangxi in 2019, and rice yield reached 6 842. 25 kg/ha. Compared with traditional yield 5 524. 5 kg/ha, it increased by 1 317. 75 kg, and increase range reached 23. 85%.

5.2.3 Support from 10 major "natural forces" excavated by Fenlong. Fenlong could make that amount of loose soil suitable for cultivation on the surface of the earth increases by 1 – 2 times; soil water holding capacity increases by 1 – 2 times; soil oxygen increases by 1 times; soil beneficial microorganisms increase by 1 times; soil available nutrient increases by 10% – 30%; soil salt declines by 20% – 40% (the purification of harmful substances in soil needs to be observed); biomass of strong crops increases by 20% – 30%; net photosynthetic efficiency of crops improves by 5% – 30%; emissions of methane and other gases in soil reduce by 10%; ground air humidity improves by more than 10%.

5.3 Theoretical attribute, definition and formula of "Fenlong law"

5.3.1 Theoretical attribute of "Fenlong law". According to attribute of "Fenlong law", comparing with manpower, animal power, and tractor tillage for thousands of years, tillage depth and loose soil amount increase in times under the "full-layer tillage" and "bottom-layer tillage". Moreover, utilization amount of "natural resources" within reasonable interval of deep ploughing and loosening has good "proportional relationship" with increase in crop biomass, economic output and land water storage. In reasonable interval range, the deeper the Fenlong tillage depth, the larger the utilization of "natural resources", and the larger the increase in crop biomass, economic output and land water storage, and vice verse. The phenomenon lays the basis for determining "Fenlong law".

5.3.2 Definition of "Fenlong law". Seen from above analysis, the connotation of "Fenlong law" could be defined as below; utilization of "natural resources" has "proportional relationship" with total agricultural output increase, ecological environment improvement effect, and economic output increase within reasonable depth of Fenlong in various land resources suitable for cultivation, and the phenomenon is called "Fenlong law".

5.3.3 Formula of "Fenlong law". Formula of "Fenlong law" is expressed as below:

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(\alpha - \theta) \cdot Y = \sum C_i
\]
where shows reasonable depth interval of Fenlong tillage, such as 60 cm is bottom line of Fenlong depth in dry land, and bottom line of Fenlong depth in paddy field is 30 – 35 cm. \( \theta \) shows depth of traditional tillage layer, and \( Y \) shows utilization amount of "natural resources" by Fenlong tillage. \( \sum C_n \) shows the total increase of agricultural economic output, ecological improvement and economic output increase by Fenlong tillage. \( C_n \) shows increase of grain yield, increase of other biomass and change of soil related factors by using "natural resources". In short, "Fenlong law" takes Fenlong tillage as media, and uses "natural resources" in multiple times to increase yield, improve quality, keep water, protect ecology, and dilute salt. It provides not only a scientific basis for agricultural economic output increase, ecological improvement, and economic output increase, but also wide research prospects for further opening up the field of agricultural research and natural science research.

5.4 Several "effect laws" supporting "Fenlong law" and their scientific significance

5.4.1 The effect law of Fenlong continuously increasing yield and improving quality during 3 – 5 years. Fenlong tillage activates various natural resources, and "physical fertility" (basic fertility) compared with "fertilizer fertility" is formed[6]. Without increasing water and fertilizer, yield of seasonal crop could increase by 10% – 50%, and quality is improved by more than 5%. After that, yield continuously increases during 3 – 4 years, and increase extent reaches 10% – 20%. For example, yield of the sixth season of rice by Fenlong in Min’an Town, Beiliu City, Guangxi increased by 1 832.7 kg/ha, with 22.65% of increase extent[10], and rice yield in the 13th season of the 7th year increased by 234 kg/ha, with 3.2% of increase extent[7]. Yield of corn in the fourth year by once Fenlong in Fanzhai Village, Guyang Town, Lankao County, Henan reached 12 324 kg/ha, which increased by 1 927.5 kg/ha than control, with 18.3% of increase extent. Yield of corn by Fenlong once in the third season of the second year in Wuqiao of Hebei increased by 3 819.75 kg/ha, with 38.19% of increase extent, and it still increased by 32% in the fourth year[9].

5.4.2 The effect law of Fenlong crops resisting to high temperature and low temperature. Fenlong tillage is more than 1 times deeper than traditional tillage, and nutrients migrate downward, forming the distribution pattern of "decreasing at upper layer and increasing at down layer". Root system has the characteristic of "following fertility", thereby realizing new deep insertion. With soil thickness deepens, the impact of external climate weakens. Under the situation, resistance ability of Fenlong crops to high and low temperature is improved, thereby stabilizing and increasing yield. Under low temperature of winter and spring in Guangxi, due to deep root of sugarcane, chlorophyll content of sugarcane leaves increased by 14.69%, and malondialdehyde content declined by 23.88%. During 41 d of continuously low temperature, yield still could increase by 2 278.5 kg/ha, with 191.31% of increase extent[17]. Grain filling rates of spring corn and winter wheat by Fenlong were respectively improved by 10.45% – 11.28% and 8.84% – 11.40%. SOD, POD and CAT activities of leaves from spring corn were respectively improved by 22.81%, 17.60% and 13.33%, while MDA declined by 12.33%[9].

5.4.3 The effect law of Fenlong soil water surplus. Water in soil is passive transpiration at daytime, and water in air is absorbed to form dew or wet status. Soil of Fenlong tillage is deep, and natural rainfall stored by "soil reservoir" is more than traditional tillage. Moreover, capillary in soil is mostly cut off, and the ability of coping with daytime transpiration enhances, and the water in deep soil is sufficient. Meanwhile, Fenlong soil is fine, and surface area of soil touching air at night is large, and thus the absorbed water in the air is more. It causes that water storage of Fenlong soil still increases by more than 1 times in crop growth period, and water use efficiency is improved by 19.1% – 50.6%[9,14]. For example, water saving amount in whole growth period of the first season of wheat by Fenlong (40 cm of depth) in Yanshan County of Hebei reached 24.73 m³/ha, but its yield increased by 20% than traditional tillage (20 cm of depth). Yield of the second season of corn by zero irrigation increased by 930 kg/ha, with 10.47% of increase extent. At present, the third season of wheat is germinating and emerging by zero irrigation. It is the exemplification of "effect law of Fenlong soil water surplus".

5.4.4 The effect law of Fenlong natural force. Fenlong super deep ploughing and deep loosening construct "soil reservoir". Fenlong soil has small bulk density and large "storage capacity" ("soil reservoir" of cultivated land is enlarged by 1 – 2 times). Infiltration rate of surface rainfall is improved by 30% – 50%, and annual increased natural precipitation exceeds 1 times, which effectively stores natural rainfall. Via large-area application, huge soil reservoir is formed, and natural rainfall is stored on the spot, which effectively decreases flood and drought. The effect of natural force by Fenlong could realize the will that "man will conquer nature" to certain degree. In dry land of South China, average water storage amount in upper, middle and lower layers by Fenlong tillage for 40 cm respectively increased by 14.93%, 15.60% and 18.03%, and surface runoff decreased by 42.03%, and soil loss decreased by 44.62%, and \( N, P, K \) loss respectively decreased by 49.61%, 31.22% and 42.29%[16]. In the northern part of the Huang – Huai – Hai, total water consumption of Fenlong soil respectively decreased by 12.2% – 16.4% and 10.2% – 14.5% than rotary tillage and subsoiling, and yield and water use efficiency respectively improved by 28.3% – 50.6% and 19.1% – 39.7%[13]. In northwest region, average moisture content in 0 – 100 cm of soil by Fenlong overwintering was 160.5 g/kg, which was 27.38% higher than control, and water storage increased by 0.47 m³/ha, with 6.15% of increase extent. Water storage amount by Fenlong for 40 cm respectively increased by 19.33% and 145.77% than subsoiling for 40 cm and rotary tillage for 20 cm[3].

5.4.5 The effect law of Fenlong fixing carbon, reducing emission and increasing air humidity. For current agriculture, it is still
difficult to fix carbon, reduce emission and increase air humidity. Loose Fenlong soil makes that emissions of methane and other gases decrease by 10%, and biomass of crop increases by 20% – 30%, and ground air humidity promotes by 10%. It is conducive to fixing carbon, reducing emission and slowing down climate warming. Additionally, reasonable utilization of green manure and chemical fertilizer has certain active effect on emission reduction of greenhouse gases CO₂ and N₂O in rice planting by Fenlong tillage, and Fenlong tillage under green manure is a kind of effective measure of reducing and curbing greenhouse gas emissions. In Fenlong tillage of potato in Dingxi City of Gansu, air humidity of field was improved by 28.3% – 62.5% after drought for 23 d, and 19.6% – 56.7% after drought for 51 d.

5.4.6 The effect law of salt dilution of Fenlong soil. Fenlong causes significant changes in soil aggregate structure, with smooth surface and large voidage, and capillary is easy to cut off. Salt in soil sinks and is not easy to move upward, realizing "salt dilution". Via Fenlong tillage in severe saline alkali land in Yuli County of Xinjiang, basicity declined by 41.0%, and yield of cotton planted in the year increased by 48.80%, and its yield in the fourth year increased by 81.7%. In severe saline alkali land in Dongying region of Shandong, first Fenlong made that soil salt declined by 31.98%, and three-times interval Fenlong treatment made that salt in 0 – 20 cm of soil declined by 57.41%, which was conducive to normal germination and emergence of crops, and yield of the planted corn increased by 73%, and yield of the second season of wheat increased by 154.22%. In moderate saline alkali land, Fenlong made that salt declined by 40% – 54%.

The effect law of salt dilution of Fenlong soil provides good application prospect for physical and low-cost transformation of severe and moderate saline alkali land.

5.4.7 The effect law of subsoil loosening and harmless cultivation of vegetation promoting luxuriant grass growth in grassland. In degenerated grassland suitable for cultivation, under the condition of protecting existing grassland ecology, subsoil tillage model is taken in grassland, and bottom-layer Fenlong soil loosening is conducted about 15 cm below the ground, and thickness of loose soil in bottom layer is 15 – 20 cm. Annual cultivation could be conducted except during frozen soil period, and the "subsoil and vegetation harmlessness" in grassland are realized. "Fenlong bottom tillage" also could conduct deep application of bottom-layer chemical fertilizer before sugarcane ratoon planting and seedling periods of corn, wheat and soybean, increase yield, improve quality, and solve the problem that crop harvest time is too less, and deep ploughing could not be conducted in time in some areas.

5.4.8 The effect law of plant coordinating with population by early rooting, mid-term development, full potential of Fenlong crops and balanced supply of soil water and nutrition. Fenlong promotes vertical development of crop roots, and root is especially developed, with more root hairs and strong activity. Due to the developed root system, both water and fertilizer are in "balanced supply" state from seedling period to mature period, causing strong plant, biomass increase, strong growth, coordinated sink-source relationship, and the ability of defending drought, high temperature and low temperature is improved. For various crops by Fenlong in Guangxi, root system of corn increased by 16.1 roots/plant, with 15.57% of increase extent, and root length increased by 5.2 cm, with 22.32% of increase extent; number, length and weight of root from mulberry respectively increased by 64.71%, 4.5% and 62.5%; root lengths of different upland rice varieties respectively increased by 61.77% and 46.41%; dry weight of cane root system increased by 86.94% – 96.17%. In Ningxia, dry weight of root system of Fenlong corn increased by 43.0%. Photosynthetic efficiency of Fenlong paddy and cane improved by 6.82% – 11.94%, and photosynthetic efficiency of soybean increased by 20.32% – 32.08%, while photosynthetic efficiency of cassava and Dioscorea opposita improved by 4.92% – 10.61%; net photosynthetic rate, stomatal conductance, intercellular CO₂ concentration and transpiration rate of corn and peanut increased by 12.25% – 32.08%, 45.54% – 64.97%, 15.28% – 75.38%, 37.53% – 40.74%; The effect law of plant coordinating with population by early rooting, mid-term development, full potential of Fenlong crops and balanced supply of soil water and nutrition has major significance in cultivation science.

5.4.9 Possibility of "Fenlong law" practice in China and its effects. According to the effects of above "Fenlong law", if current tillage depth 1.65 cm of 67 million ha of cultivated land in China is deepened to 36.5 cm, tillage depth of 13 million ha of saline alkali soil is deepened to 40 cm, and tillage depth of 67 million ha of grassland is deepened to 35 cm, total activated soil could reach 648.2 billion m³, which increases by 450.2 billion m³ than current farming manner, and increase extent reaches 1.27 times. For 67 million ha of cultivated land, Fenlong could make grain yield increase by 100 billion – 150 billion kg according to the production of 1 500 – 2 250 kg/ha of agricultural product every year. For 13 million ha of saline alkali soil, Fenlong could make that grain yield increases by 60 billion kg according to the production of 4 500 kg/ha of agricultural product every year; for 67 million ha of grassland, Fenlong could double grass every year, and a large number of high-quality meat and milk products can be increased every year. These increased food and other agricultural products can feed 400 million population. What’s more gratifying, 1.47 million ha of Fenlong land resources could increase 2.67 m³/ha of natural rainfall storage, and water storage of land could reach 88 billion m³, which will have an immeasurable effect in reducing drought and flood, and promoting industrialization, urbanization and ecological improvement.

6 Conclusions and discussions

6.1 Application of formula determined by "Fenlong law" The formula of "Fenlong law" is a kind of estimation method of trend and macroscopicity, which reflects Fenlong tillage and natural production, and its detailed expression formula and calculation appli-
culation need to be further studied.

6.2 Impacts and significance of "Fenlong law"  "Fenlong" seems simple and easy, but scientific connotation is profound and significant. It belongs to a kind of technology returning to nature, activating and using natural resources, and curbing the degradation of soil productivity. Its biggest scientific discovery and creation are "full-layer tillage" or "bottom-layer tillage". Fenlong also could be applied to transform and use saline alkali land, degraded grassland and desertification land, and single "cultivated land agriculture" of land resources transforms into "large-pattern agriculture" of "cultivated field + saline alkali soil + degenerated grass". Fenlong could be applied in China and even the world and all agricultural crops. Via unique tillage manner, the ways of multiple incremental utilization of "natural resources" is created, and it is a "big explosive" deep utilization of natural resources by human beings, making that human beings step into more development paths of "living on nature", and realizing the effective expansion of human survival and development space. "Fenlong law" has far-reaching significance for further understanding core scientific theory and some supporting theories of Fenlong, determining and explaining the three-dimensional, deep and wide application and protection of human activity space, promoting human beings to further understand, revere and use nature, deeply share all kinds of animals and plants and beautiful environment given by nature, and realizing harmonious development between man and nature.

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