

The Main Experiences for Soil and Water Conservation in the Yellow River in China

Zhang Li and Li Min

Bureau of the Upper and Middle Reaches of Yellow River
E-mail: limind@pub.xaonline.com

The history of soil and water conservation (SWC) can be traced back over thousands of years in the Yellow River in China. In recent 50 years, SWC is developing quickly in the region and gained great benefits: treated area was over 0.18 million km², sediment reduction was 300 million t/year discharged into the Yellow River, crop accumulation was 60 billion kg, increased provision was 4 billion kg/year in the 1980s, fruit production was 15 billion kg/year, firewood was 35 billion kg/year and green forage was 25 billion kg/year, poverty elimination of the persons were over 10 million. The practices are summarizing as the following 6 aspects.

1 Government roles

The basic characters of SWC practice were necessary to organize innumerable households or families to harness a crisscross network, thus decided that government act an inevitable important role at the process of fundamental construction. As an important area of SWC in china, the Yellow River Watershed set up in harmony with branches representing government function in the fifties, in the sixties, found SWC commission in Middle reaches of the Yellow River including national relative ministries and commissions as well as provincial governments along the river which brought into playing an important role to organize management work of SWC in the provinces of the watershed in 1981, SWC commission in the Middle reaches of the Yellow River held the first commission conference who Planned in detail and arranged work under new situation, so as to increase controlled areas by governments year by year and reach to conserve 10,000 km² per year. In 1986, it boost the second commission conference, presenting sixteen words principle: "promote quality, stable velocity, enhance efficiency, firm protection" in accordance with water and soil situation. This meeting played an important effect to complete the seventh five-year assignments and guaranteed afterwards work of SWC healthy development. In 1996, the third conference defined the guidance to speed up prevention and supervision steps, meanwhile, put forward that hold a commission conference per year hereafter to strengthen work guide of SWC in the Middle Reaches of the Yellow River and raised a report to the State Council for adding funds for SWC. In may, 1997, the fourth commission conference presented 《the report about accelerating conservation comprehensive treatment in the Middle Reaches of the Yellow River》 again to the State Council that asked central authorities for adding funds and picking up speed to administration. In June at the same year, vice premier Jiang Chunyun reviewed work of SWC in the North Shaanxi and submitted a report to central government leaders. Jiang Zemin, Li Peng and other leaders had an important direction to work of SWC in the Yellow River, calling on reconstructing a Northwest Region with Beautiful Mountains and Rivers. In August, the State Council kicked off "live experience communication meeting to prevent soil erosion and create ecological agriculture in ShanBei. Under the indication spirits of the central government. This year, The Nation significantly increased SWC funds. After the 5th commission conference, in 1998, The State greatly added investment which made work of SWC enter a new development period in the Middle Reaches of the Yellow River.

2 Making policy of preference

Early 1980s', with the development of the system of contracted responsibility linking remuneration to output, the model and system of operation and management by single household contract or ally households contract to improve a little scale river basic was in blooming to the time's demand. And had won significant breakthrough of SWC in treatment method. In order to transfer using property of

non-farm arable lands healthily, the relative policies were regulated by ranked governments. Many methods, such as organization of the collection to control and develop and switch using property to create collection economic companies, were carried out to control and improve “four barrel” according to the rule who treat, who prefect, who enjoy benefit. In order to encourage offices, company and institutions, using properties were regulated not to vary for a long time and may be inherited or transferred. Social group and other private organizations and persons took part in to control “four barrel “ in varied way and enjoy favourable policies in tax, release, purchase.

The policy also permitted to construct temporary house for production and administration, transfer the using property of far-hill or poor mountains freely but responsibly and so on. All these favorable policies stimulated greatly the progress of SWC. It was predicted that all ranking office would continue to regulate new policy and call on enormous farmers to accelerate control of soil erosion. During high-speed development period, there had 3.5 million households to control small watershed by contract by taking up about 38% of the total. After then, contract by households made further progress. Contract by households, lease corporation to stock share, auction ”four kinds of waste land” using property and other fashions coexisted that became a significant feather of conservation at that time. By 1998, the areas that the using property of four barrel had been transferred Basically reached 91.5million acres in the Yellow River. 38% of total transferred area. Involving 1.35million households and 1200 companies and many institutions, in which, 22.5million acres were auctioned, 54 million were contracted, 13.5million were leased, 1.5million were operated by joint operation to stock share, about 40% of area had been controlled and improved, far beyond 25% of the nation’s development rate at the same period.

3 Increasing capital

Soil erosion of the Yellow River Basin mostly happened at the undeveloped and old and poor border region, there needs lots of investment for soil erosion treatment, and may not be all afforded by the local governments and masses in soil erosion region; on the other hand, to control soil erosion in the middle and upper reaches of the big branches in China are not only necessary to develop the local production, But also the nation’s requirement meanwhile, it is not only the demand to ecological construction, and the minority regions appeal to improve economy, so to some extent, nation must inject a certain capital by the way of transferring the experimental project of a small watershed and it began to put into effect from the early eighties in the Middle Reaches of the Yellow River, investing 2—5 million yuan into water conservation annually, the annual investments per sq. kilometer were 20,000—40,000yuan, the controlled velocity was about 10%, ten times of that of the former same period of the Yellow River Basin.

The key projects of SWC began to make a plan in the Yellow River Basin since 1982. The first-period project was completed for 10 years, at present, the-second-storage of the-second-period are moving on. This project ran smoothly and made the good result attributing to capital’s enough. Among them the project of Sanchuan River Watershed in Shanxi province had already reached the expect goal and passed through the check and acceptance.

With the development of the opening-up situation, using foreign capital for SWC also obtained the nation’s support. Since 1994, a large loan from the World Bank, the Asia Development Bank and other international financial organizations attributed to control soil erosion. total loan 0.15billion USD for the first period project from the World Bank were used for SWC in the Loess Plateau, the total investment excess 2 billion yuan including counterpart fund, the item began since 1994 and went on smoothly. It wined the identity of the World Bank with significant benefits, in 1999, a loan of 0.15billion\$ from the World Bank was be injected to carry out the second phase project.

4 Benefits

In recent years, economic development in soil erosion region and poverty elimination of the masses was focused. It was the direction idea for switching interests of SWC from seeking ecological benefit and giving attention into economic benefits, ecological benefits and social benefits together, especially stimulating the farmers’ enthusiasm. With economic benefit in the serious soil erosion region for near 20 years, one of the most typical description in the report of Qian Zhengying who was the former minister of

Ministry of Water Resources put forward to central government “ to develop resources would be the right direction to improve treatment in Loess Plateau. In her report, Qian Zhengying demonstrated that the joint of economic benefit and ecology benefit had been found through many years” exploitation, which could be planted to improve peasant’s income in Loess Plateau of the Yellow River basin. Thus, peasants’ enthusiasm had been ignited by planting seabuckthorn. Since 1986, with the development of using resources in large soil erosion area around the center of Loess Plateau, it has proven to be right by practice. During 10 years, areas by the method to use resources increased over two times in the Yellow River Basin, the processed products export a few except for contenting the domestic demand. Peasants by planting seabuckthorn in the region, not only had controlled soil erosion, improved the operating condition, but also got enough fuel, fodder and fertilizer, a large number of example Counties (banner). For example, Youyu of Shanxi Province; Wuqi of Shaanxi Province; Zhenyuan of Gansu Province; Zhunger of Inner Mongolia; emerged in the Yellow River Basin. Wang Weizhu, a farmer in Dongsheng city of Inner Mongolia has planted seabuckthorn for 15million acres since 1986. Now he utilized seabuckthorn to feed sheep and goats. In 1998, his income was over 10,000 yuan by planting. This attracted the other farmers to plant seabuckthorn.

5 Strengthening technology

Extension of science and technology processed an important position in later soil conservation work, the guidance of science and technology many families and households improve ecological environment and develop the agricultural production by control soil erosion.

The most successful extension was apple planting and management techniques. In history, there was no apple-planting on Loess Plateau in middle reaches of Yellow River. In earlier 50s’, soil and water conservation station experimental apple-planting was introduced by Yellow River Conservancy Commission. Tianshui Experimental soil and water conservation station and made success at the same time, Donghu horticulture garden was entitled to be the first class farm in the east of Gansu province was be settled by the Station of Yellow River Conservancy Commission in Dongzhi of Gansu province. And introducing apple was carried out spread testimony, now apple has been planted in Qinyang of Yan’An. In the southeast of TaiYuan, there became the Chinese important apple production region and annual fruits yields, which was mostly apple, were enormous enough to fulfill supply and not only in home market but also around world. Among them, ShaanXi province in recent years, apple planted area was 6million acre in WeiBei arid plateau and the north mountain slap. The annual yields already was about 4million T, a light future (prospect) had be shown mostly to develop small basin economic in soil erosion region, the controlled area by biology measure was over 70% and became the key step to treat soil erosion. Loess Plateau in Yellow River Middle is arid and semiarid climate. It was necessary to recover vegetation with limited precipitation and improve treatment effectively, the spread both runoff forestry and engineering soil preparation forestation technology significantly improved preserve rate and growing velocity of water preserve. The two technologies spreads significantly in the project by the loan from World Bank with a rather good result and were approved by the World Bank officers.

The spread for constructing terraced fields mechanically promoted the fundamental farmland construction speed greatly, since 80s’, the annual constructed fundamental farmland in the Middle Reaches of the Yellow River jumped across the three stages continuously: 66,666.7hm², 133,333hm², 200,000hm². In 1996, the work caught new stage 4 million acres, it became an important milestone in the history of development of SWC of the Middle Reaches of the Yellow River

In recent years, harvesting rainfall irrigation engineering was popularized in the middle region of the Yellow River, which became the new momentum of the developments of the arid mountains so as to further improve the productive force of fundamental farmland. Science and Technology as the first element enhanced the improvement of treatment efficiency and economical development of the region.

6 directing law

In 1991, China issued 《SWC Law of the People’s Republic of China》, which further reinforced legality construction of SWC. Now nation matched legality system and law’s enforcement system which

had taken on basic shape for ten years' consecutive effort in every land of the Yellow River Watershed, and put into effect. It was calculated that in the recent years, over 7,200 cases of breaking law of SWC were examined, more 12,500 rules of SWC were approved, more 41million yuan were levied with cure fees. The fees urged protection, meanwhile, construction company injected more 0.3 billion yuan, so efficiently stop man-made deterioration of erosion in the region of the loess plateau.

The special organizations had been set up in the important region for precaution and supervise and relative law had been issued. The large-scale energy exploration brought into worse effort to fragile ecological environment from the 80s' in the area on the boundary of Shanxi, Shaanxi, Inner Mongolia in the Middle reaches of the Yellow River. In 1998, under state council's endorsement Nation Plan Commission and Water Conservancy Ministry jointly issued 《Regulations to Develop and Construct Water and Soil Conservation on the Border Area of ShanXi, ShaanXi, Inner Mongolia under the Leadership of Nation's Commission Water Conservancy》 for the sake to protect environment and guarantee sustainable development of the regional economy,

In 1991, Ministries and relative institutions of the three Provinces were promoted to be leading group and prepare to sponsor to found supervise bureau on the boundary of Shanxi, Shannxi, Inner Mongolia. The region on the boundary of Shanxi, Shannxi, Henan is an important development zone of some mineral resources, for example, gold, molybdenum, copper, it was entitled to be "gold delta" with the exploration of gold and other mineral resources, the local ecological environment had been destroyed, mudflow and lots of noxious material polluted environment around and flow into the Yellow River to deteriorate seriously the water quality. In order to stop illegally exploitation of mineral resources and control man-made soil erosion and environment pollution, many institutions including the Bureau of the Middle Reaches of the Yellow River, organized several investigations, in 1999, under the up rank offices' agreements, the region began to be carried out the program of prevention and treatment and was put into the nation's emphasis supervision region.