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Resources, Environmental and Economic Patterns and Sustainable Development Modes of Silk Road Economic Belt

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1. Basic scientific problems and resource and environment patterns of Silk Road Economic Belt

Chinese President Xi Jinping proposed a Silk Road Economic Belt on a visit to Kazakhstan in September, 2013, to promote greater cooperation, development and prosperity, and strengthen policy communications, roads Unicom, trade flow, currency in circulation, and the people connected, among the countries of Asia, Europe and Africa.

1.1 Basic international key scientific problems of Silk Road Economic Belt

- 1.1.1 The evolution and driving forces and sustainable utilization of LUCC of Silk Road Economic Belt**
- 1.2.2 The spatial patterns and interactive mechanism of ecology, environment, and socio-economy systems and innovative models of sustainable development in different countries of Silk Road Economic Zone**
- 1.3.3 Assessment of resource and environment carrying capacity and ecological service functions of Silk Road Economic Belt**
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- 1.5.5 Evaluation of Impacts and response and international cooperation of global climate change on Silk Road Economic Belt**
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- 1.7.7 The causes and mechanism of poverty and international poverty alleviation of Silk Road Economic Belt**
- 1.8.8 International scientific decision-making supporting systems and thinking tanks of Silk Road Economic Belt**

We have implemented international Comprehensive scientific expedition and cooperation along Silk Road Economic Belt for ten years. (2005-2014)

- 1. Northeast Asia**
- 2. Central Asia**
- 3. Southeast Asia**
- 4. South Asia**
- 5. Africa**

Publications



《中国北方及其毗邻地区综合科学考察》丛书（10部，科学出版社，2014）

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INTERNATIONAL FORUM ON REGIONAL SUSTAINABLE DEVELOPMENT OF NORTHEAST AND CENTRAL ASIA

BEIJING, PRC 2011.06.09



June 15-16, 2014, Beijing, PRC

International Conference on Ecology, Environment and Sustainable Development of Silk Road Economic Zone

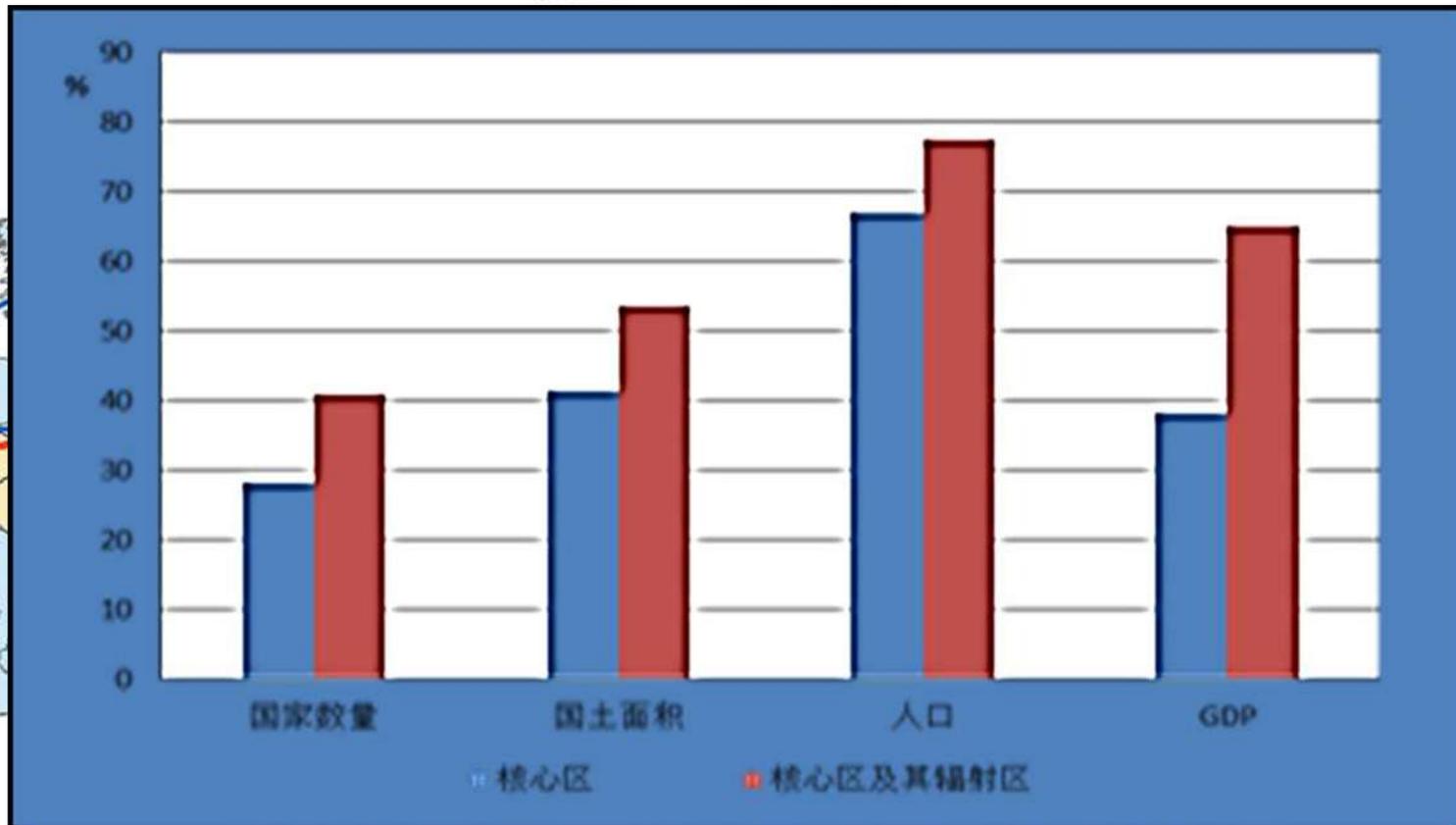
2014.6.15



The new patterns of international geo-political situation

- EU
- G20
- Shanghai Cooperation Organization——印巴即将加入。
- APEC
- TPP
- One Belt, One Road——Cooperation , Common Benefits,
Win-Win
Good Neighbors, Good Partners, Good Prospects

Range of Silk Road Economic Zone



Proportion of some primary index of Silk Road Economic Zone

Data resource: World Bank 2012.

Legend

- 西伯利亚大铁
- 海上丝绸之路
- 古丝绸之路
- 丝绸之路经济带沿线国家

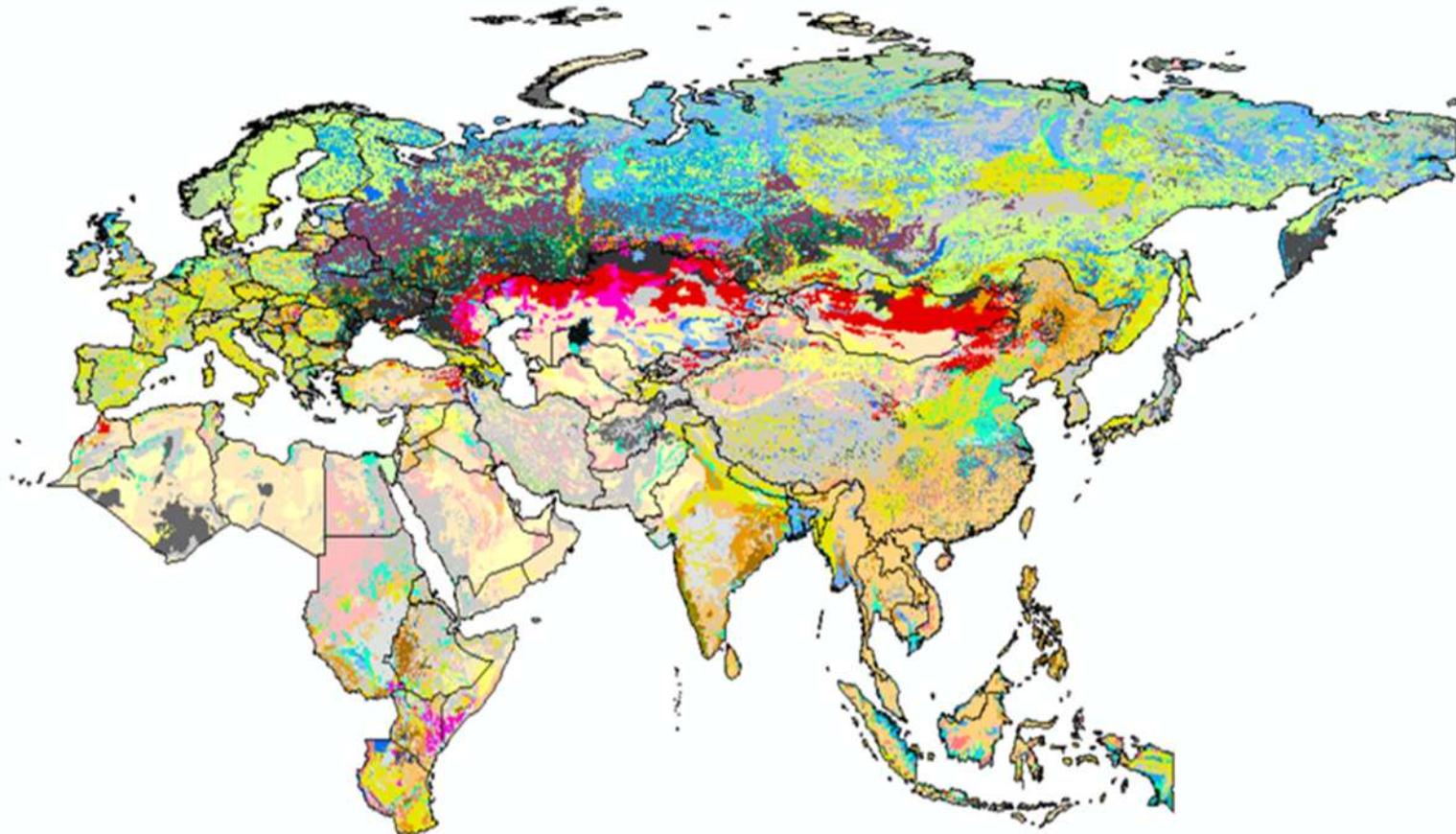
0 550 1,100 2,200 3,300 4,400 Miles

1.2 Resource and environment pattern of Silk Road Economic Belt

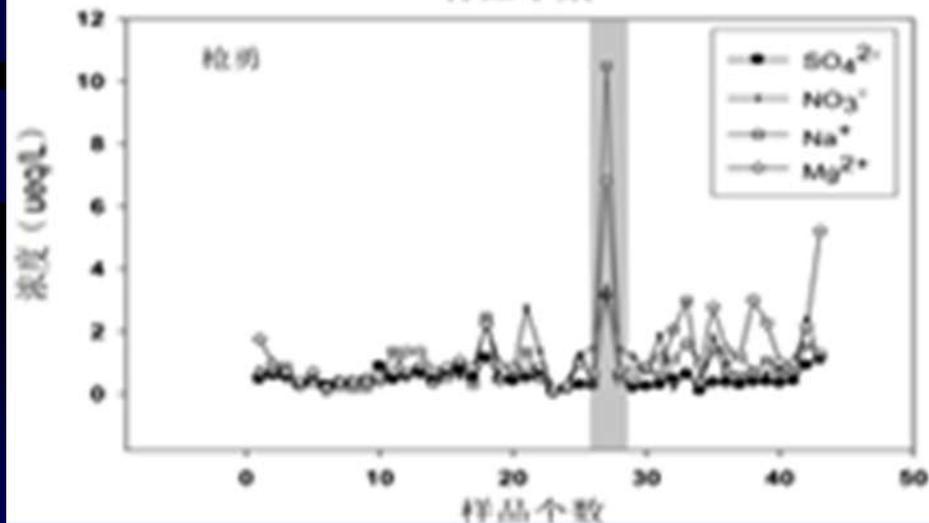
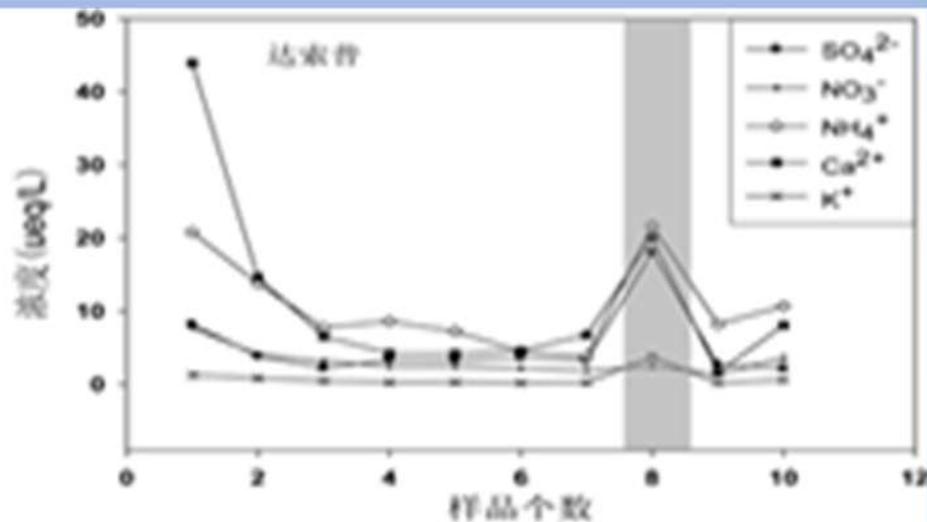
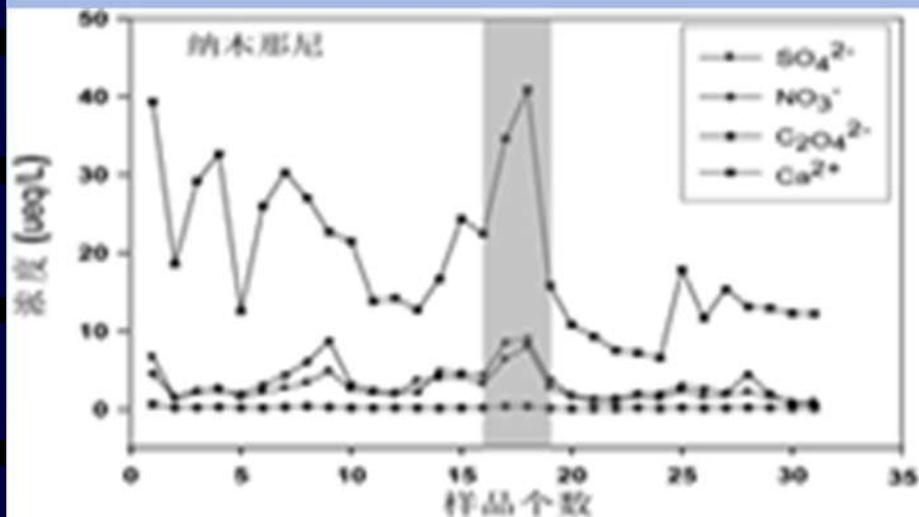
Soil type

- 1 Acrisol-AC
- 2 Alisol-AL
- 3 Andosol-AN
- 4 Arenosol-AR
- 5 Anthrosol-AT
- 6 Chemozem-CH
- 7 Calcisol-CL
- 8 Cambisol-CM
- 9 Fluvisol-FL
- 10 Ferralsol-FR
- 11 Gleysol-GL
- 12 Greyzem-GR
- 13 Gypsisol-GY
- 14 Histosol-HS
- 15 Kastanozem-KS
- 16 Leptosol-LP
- 17 Luvisol-LV
- 18 Lixisol-LX
- 19 Nitisol-NT
- 20 Podzoluvisol-PD
- 21 Phaeozem-PH
- 22 Planosol-PL
- 23 Plinthosol-PT
- 24 Podzol-PZ
- 25 Regosol-RG
- 26 Solonchak-SC
- 27 Solonetz-SN
- 28 Vertisol-VR
- 29 Rock Outcrops-RK
- 30 Sand Dunes-DS
- 31 Water bodies-WR
- 32 Urban,mining,etc.-UR
- 33 Salt flats-ST
- 34 No data-NI

Soil type in Silk Road Economic Zone



Qinghai-Tibet plateau's ice core record on pollutant in the Iraq War, 2003



War started Black rain
Oil field fires

chemical record.

1.2 Natural Resources Pattern

- For countries along the Silk Road, they have inherent advantages of resources cooperation and wide development space of resources market due to adjacency relationship.

1.2.1 Middle East is abundant in oil; Russia, Central Asia and North Africa have abundant oil and gas resources; Spatial mismatch of natural resources' production and consumption, Silk Road Economic Belt is the most centralized area of coal exploitation and consumption in the world, there is vast cooperation space for energy resources trade in it.

- In 2012, explored oil reserve in Middle East is 109.3 billion ton, accounting for 48.4% of the world and 77.8% of SREB. According to present degree of exploitation, the oil in Middle East can exploit for another 78 years. Russia, Central Asia and North Africa's explored oil and gas reserve is respectively accounted for 95.1% and 92.1% of SREB.

- **Middle East, Russia, North Africa and Central Asia are dominating oil and gas production areas but its' consumption ability is limited. While Europe, PRC, South Asia and Southeast Asia, yield cannot meet demands.**
- **In 2012, explored coal reserve in SREB accounting for 54.1% of the whole world, but the ratio of production and consumption reached 87.6% and 88.7%, respectively. PRC's coal exploitation and consumption account for 54.2% and 56.6% of the economic belt, and 46.4% and 50.2% of the whole world. But its explored reserve only occupied 24.6% of the economic belt.**

Overview of primary mineral resources of Central Asia, Russia and Mongolia

国家或地区		矿产种类	资源概况
中 亚	哈萨克斯坦	钨矿	储量在独联体国家中排第一位
		铬	储量排世界第一位
		铝土矿	储量居世界第十三位
		镍	储量居世界第十二位
		钴	储量居世界第七位
	乌兹别克斯坦	金矿	2012年金储量为1700t,居世界第十位
	塔吉克斯坦	铅锌矿	中亚国家中储量第一
吉尔吉斯斯坦	铋矿	独联体国家中储量第一	
	锡和汞	在独联体国家中居第二位	
蒙 古	铜矿	储量居亚洲第一位	
	铁矿	品味高, 储量大	
俄 罗 斯	铜矿	约占世界总储量的 10%	
	锌矿	占世界探明储量的 15.3% , 居世界之首	
	镍钴矿	储量居世界第一位	
	钼矿	储量居世界第一位	

- ❑ **PRC is a main country of metal mine demanding and production, especially for iron, copper and alumina. But when it comes to reserve and ratio of reserve and production, PRC's situation is not optimistic. These 3 kinds of metal resources just can meet demand of 30 years, so there will be a huge demand gap.**
- ❑ **Other countries in the economic belt, such as Russia and Kazakhstan, which metal mine reserve is rich with limited consumption demand.**
- ❑ **To some extent, for the emerging market economies, such as PRC, India, there is complementary need in metal resources trade between these countries and other countries in SREB, and it will become a vaster market in metal resources trade in the future.**

1.3 Economic Pattern of Silk Road Economic Belt

1.3.1 Economic development reveals three gradients across east, middle, and west

- ❑ **East zone:** Emerging economy like PRC, Russia and India, large country scale, middle age of industrialization, continuous rapid growth due to institution reform and opening up.
- ❑ **Middle zone:** two typical types: one is high income countries with abundant endowment of resources, such as petroleum exporting countries in Middle East; another is less development countries with abundant endowment of resources such as Central Asia countries, in primary stage of industrialization, economy grows with relative low speed.
- ❑ **West zone:** EU countries, developed countries, reach the post industrial stage, economic development rely on tech innovation, recently, low economic growth rate due to international financial crisis.

Economic development differences across three zones

	Income level	GDP per capita (US \$)	GDP proportion (%)	Non-agriculture proportion (%)	Growth rate (%)
West zone	High	37419	48.9	98	0.34
East zone	Upper high	7210	31.6	90	5.32
Middle zone					
Petroleum exporting countries in Middle East	High	43939	4.2	99	4.99
Other developing countries	Low	4955	15.3	86	3.55

Source: World Bank

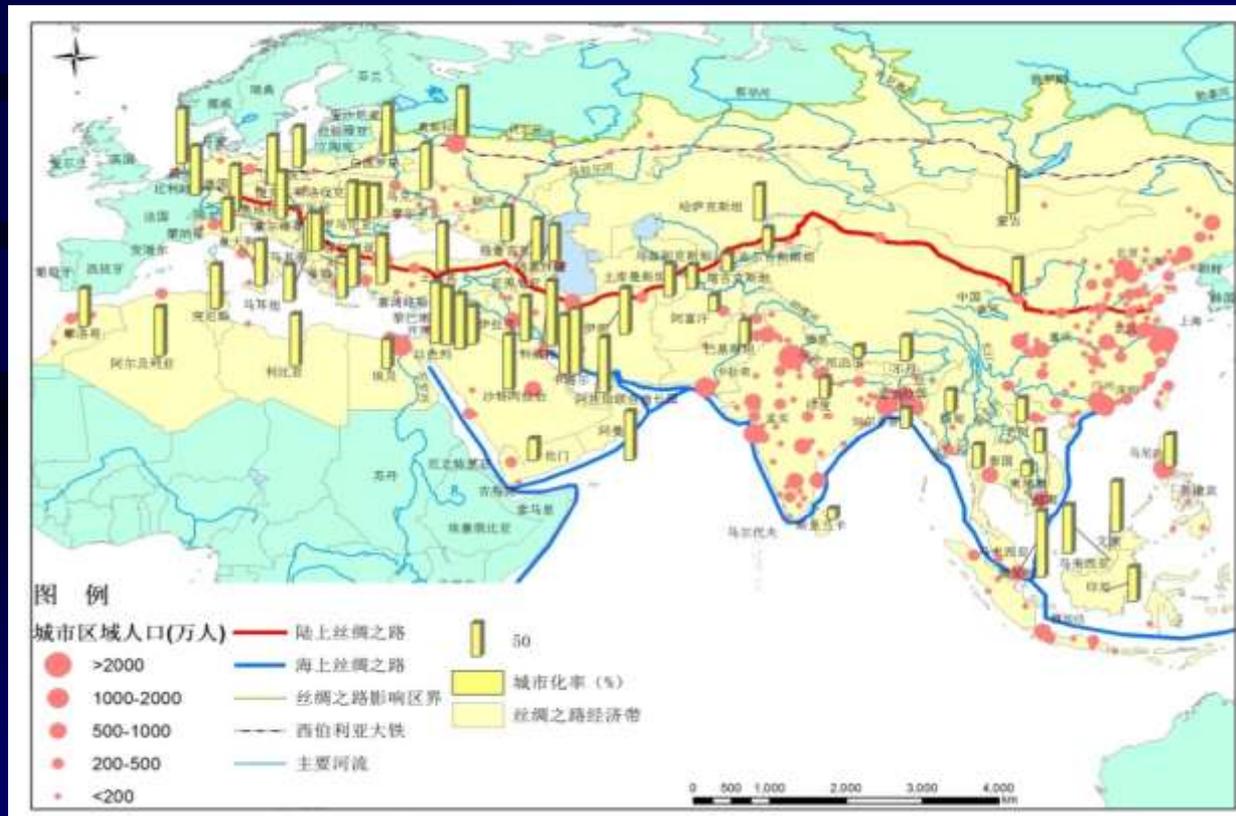
1.3.2 Three gradients in national specialization, strong complementary involved in regional development

- **East zone:** East Asia, Southeast Asia, Global manufacturing factory, relative complete industrial system, with relative abundant capital, labors and technology resources, main manufacturing goods exporting regions, most industries stay in the middle part of smile curve; moreover, PRC is confronting overcapacity, with urgent need of expanded market.
- **West zone:** EU countries, advanced tech, developed industry, stay in the high end of small curve, have advantages in research, brand and intellectual property, however, lack of main natural resources, with urgent need of development resources.
- **Middle zone:** Middle East, Central Asia, and North Africa. With very abundant natural resources; Economic development rely on oil export, but with single industrial structure, and is vulnerable to against global economic fluctuations. Those countries need to increase national competitiveness by relying on abundant natural resources endowment.

1.3.3 Economic and urban dense belts locates along coast, rivers and main roads

- ❑ Economic and urban development in coastal areas are mainly located in the Pacific coast and the Indian Ocean region. Along river, development of regional economy and urbanization are mainly distributed eight urban belt. Along the road, economic and urban development areas are mainly distributed in the first Eurasian Continental Bridge, the second Continental Bridge, and the third Mainland Bridge.
- ❑ The spatial differentiation of urbanization level showed a decreasing trend from northwest to southeast. The regional population showed a decreasing trend from southeast to northwest.

Urbanization Pattern of Silk Road Economic Belt



Source: World Bank 2012, United Nations, Department of Economic and Social Affairs, Population Division(2012).

1.4 Tourism spatial pattern in Silk Road

1.4.1 There are rich tourism resources in many types in Silk Road, which appear a decline trend from Europe in the west, to Asia and the Pacific in the east, and to the Middle east-Africa in the Central area. Natural tourism resources concentrate on Eurasia Land Bridge to form the inland natural tourism belt, and cultural tourism resources are abundant along Maritime Silk Road to form the coastland cultural tourism belt.

1.4.2 Tourism economy in Silk Road increased rapidly, which have been well considered as the most activity area all over the world; Tourism economy shows a distribution characteristic of two central areas and three development axes that emerging economy and traditional capitalist countries have been the main influences on tourism development in Silk Road; The Silk Road, which connects two major tourism destinations and international outbound tourist markets in the world, has a firm market foundation and a huge potential for growth.

1.4.3 Tourism Spatial Layout in Silk Road

- The characteristics of spatial distribution on tourism resources and tourism economy have high similarity: western and eastern sides of the Silk Road are the tourism resources-abundant regions, major tourist markets and tourism destinations. Central region of the Silk Road usually be considered as tourism resources- inadequate region and tourism under-developed region.
- Therefore, to establish a Silk Road international ecological tourism belt and a Silk Road international cultural tourism belt for tourism resources exploitation and international cultural exchange, we could divide the future Silk Road into two centers, four development axes, and seven plates.
- That include: coastal vacation plate, Middle East-West Asia cultural experience plate, Central Asia cultural experience plate, South Asia cultural experience plate, East-North Asia natural and cultural tourism plate, and southeast coastal vacation plate.

2. Main modes and paths of sustainable economic development for Silk Road Economic Belt

- To promote the level of sustainable development of the Silk Road Economic Belt, the best way is to explore typical modes which is suitable for its basic regional conditions, for its geopolitical circumstances based on distribution patterns of its resources, environment, ecology, society and economy.
- Main principles that should be obeyed in the process of revival for silk road

**Solidarity and mutual trust;
strengthen communication;
ecological civilization;
scientific support;**

**cooperation with win-win results;
overall planning;
green rising;
people's livelihood first.**

2.1 Ecological Civilization Mode



2.1.1 Protect important ecological space along silk road by means of natural reserves.

- **With the support of the inscription process, establish nature reserves, protect river and lake wetland ecosystem, forest and grassland ecosystem along the Silk Road Silk Road Economic Belt, build sustainable development ecological security barrier.**

2.1.2 Build silk road ecological economic Zone on the basis of circular economics.

- **On the basis of maintaining the structure and function of the natural ecosystem, in accordance with the principle of reducing energy consumption, material consumption, pollutant emissions and improving efficiency, industrial restructuring should be speeded up, circular economy should be built, industrial upgrading should be boosted.**

2.1.3 Building monitoring and early warning and emergency system of ecological environment in Silk Road Economic Belt

- We should make joint efforts to build monitoring and early warning system of environment and transnational emergency system of preventing disasters and reducing damages. Based on the principle of prevention first and comprehensive treatment, we should focus on solving the environmental problems which dramatically affected people's health condition and improve prevention of water, atmosphere and soil pollution to stabilize patterns of ecological security, make sure a high-class environment and enlarge environment capacity.

2.1.4. Carrying forward culture of Silk Road and advocating core value of ecological culture

- To advocate ecological civilization and create a cultural atmosphere of concerning, supporting and participating ecological construction and environment protection from the whole society, we should propagandize knowledge, policy, laws and rules of ecological civilization through various forms, directions and levels and develop ecological culture. Through building communication system of ecological culture of Silk Road, human value can be affected. Sense of master will be eliminated from human beings step by step to make harmonious coexistence of human beings and nature come true.

2.1.5. Building convention of ecological civilization system of Silk Road

- Based on the cooperation platform of Silk Road, for preventing ecological environment risk transferring from countries, we should create convention of ecological civilization system of Silk Road which should emphasize on green government, enterprise's environmental responsibility, transboundary river, forest and grass ecological system protection, transboundary pollution compensation mechanism and reward and punishment mechanism.

2.1.6. Building ecological homestead of Silk Road

- Centralized on primary urban areas in SREB, we will create a whole green environment, low-carbon societies, ecological villages, ecological infrastructures and ecological urban system to build an ecological homestead with harmony, quietness and comfort, namely ecological and livable human settlement.

2.2 Regional Economic Integration Mode

2.2.1 Cooperation modes and policy suggestions on natural resources

□ Enterprise oriented cooperation mode

Under the background of globalization and international labor division, different countries take their own advantages of natural resources, capital and technology to make cooperation.

The basic framework of enterprise oriented cooperation mode is encouraging countries abundant in natural resources open its mining market to foreign mining enterprises by means of overseas equity acquisition, venture investment, capacity purchase, etc.

➤ **Overseas equity acquisition**

By agreement and stock equity purchase, natural resources demanded countries can cooperate with natural resources abundant countries.

➤ **Venture investment**

Due to deficient in exploitation technologies, natural resources exported countries open its mining exploitation rights and yield rights to attract venture investment.

➤ **Capacity purchase**

By making investment directly on exported mining enterprises, natural resources demanded countries get certain years entitlement on mining resources supply.

□ **International geopolitical cooperation mode**

Resources security plays a vital role in guarding nation safety. By constructing national-level organizations that share common interests, different countries with various resources abundance can cooperate with each other.

➤ **Joint venture development**

Principal capital would be gathered to fund mining resource incorporations bilaterally, in which way stock share would be quite flexible to deploy.

➤ **Energy community mode**

In this mode, countries along Silk Road Economic Belt would construct negotiation system on oil price, demand and supply information, investment and finance, etc.

➤ **Strategic alliance mode**

It would be a long term trade contract in natural resources, which secure natural resources supply stable to avoid the risk of price fluctuation.

□ Advices on international resources cooperation

➤ Reasonable international labor division and cooperation

For modern international labor division, comparing with developed countries, developing countries are at a disadvantage which has relative monotonous pillar industries and mainly export natural resources and crude products. Countries along Silk Road Economic Belt are developing countries mostly, so it would wise to switch international economic order down to build a new mode of cooperation system on the basis of reasonable labor division and trade relationship.

➤ Resources driven growth with highlights on innovation

When one country is abundant in natural resources, it is a viable path by promoting economic growth on natural resources supply to attain capital, technology, such as PRC, Russia, Mongolia, and countries in Northern Africa.

As natural resources recession, it should pay much attention on innovation to switch industries upgrading, science and technology advancement which are advantageous domain of developed countries. So developing countries and developed countries should work together to build bilateral beneficial modes in boosting sustainable development at the global wide.

2.2.2 Three strategic steps to create the Economic Community of the Silk Road

❑ Found of regional common market, rolling program of internationalization of RMB

- In the condition of political mutual trust and mutual benefit collaboration, each country exchange development strategy, and negotiate planning and implements to cooperate.
- Explore the ways achieving full convertibility and settlement of RMB. At first, expand the scale of RMB settlement, the key point is RMB payment in international energy trade, especially along PRC, Central Asia, West Asia, and Russia. Second, carry out integration of PRC-Central Asia regional finance, RMB as a kind of and reserved currency in Southeast Asia, and Currency settlement mechanism and bilateral settlement mechanism between PRC and EU.

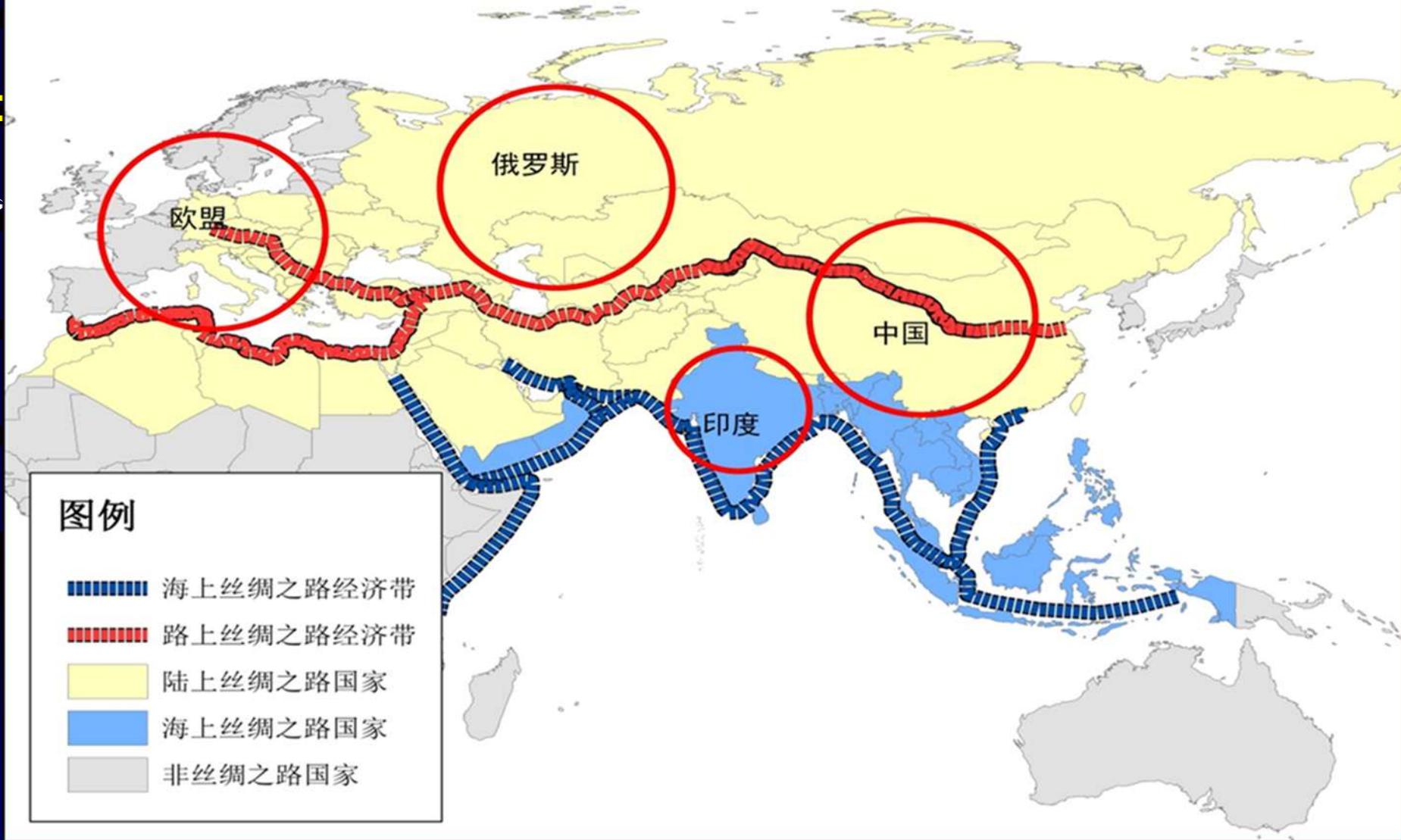
❑ Establish a free trade area when conditions are ripe for the countries

- Promote the development of the Shanghai Cooperation Organization as a free trade zone; promote the economic integration along PRC ,Central Asia and Russia.
- On the foundation of economic integration along PRC, Central Asia and Russia, stretch the range of free-trade area at both ends of the Eurasian. Active docking of the free trade agreement along Commonwealth of Independent States.

❑ Promote the construction of Economic Community of the Silk Road

- Establish organic community organizations; promote integrated development in the key areas of tourism, energy, chemicals, logistics and other industries; establish the Silk Road Investment Bank, the aim is to use the international capital markets and funds within the Community; promote balanced and stable development of the Community; sign the convention of integration; eliminate personnel crossing barriers in order to promote regional optimal allocation of production factors.

Spatial optimization pattern of Silk Road Economic Zone



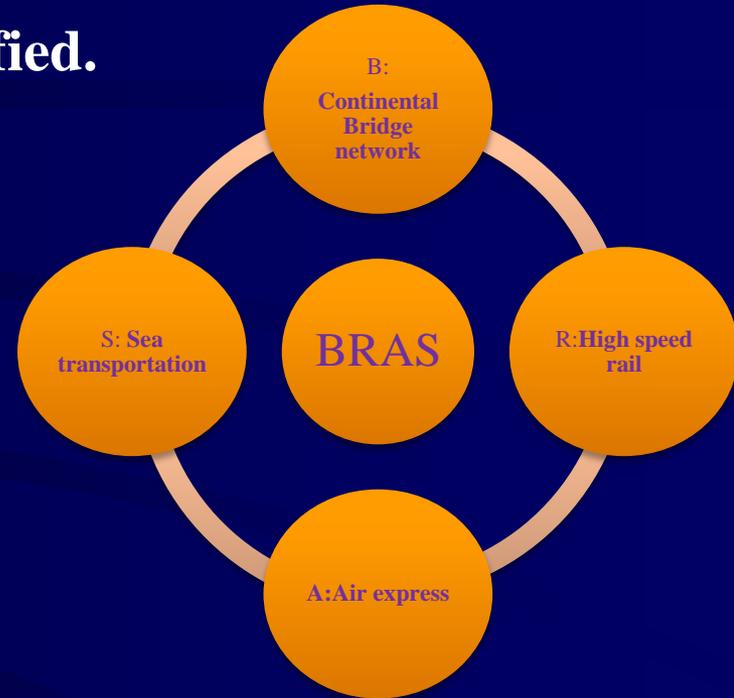
□ Regional cooperation and win-win pattern, the formation of international division of reasonable labor gradient

Cooperation between countries of different levels of development, different cultural traditions, different resource endowments and different social systems should be advocated, and the fruits of development should be shared. All countries are equal participants, cooperative and win-win "community of interests" and "community of destiny" with mutual benefit. Through cooperation and exchanges, the geopolitical advantage should be turned into the results of pragmatic cooperation, and eventually forming a rational international division of labor gradient.

- **to establish international economic order of equality and mutual benefit, win-win cooperation and common development**
- **complementarity and cooperation of the east, the middle and the west**
- **to enhance the ability of jointly coping with global financial crisis**

2.3. Transportation Economic Belt Mode

- Develop BRAS transportation system, to promote transportation system inter-connected and diversified.



2.3.1 Major cities as nodes

Set major cities as nodes, including Beijing, Almaty, Moscow, Warsaw, Berlin, Rotterdam along Trans-Siberian railway; Xi'an, Lanzhou, Urumqi, Tashkent, Ashgabat, Tehran, Istanbul, Budapest along Old Silk Road; Shanghai, Singapore, Mumbai, Karachi, Dubai, Cairo along Maritime Silk Road.

2.3.2 Five Passageways and Pole-Axis Construction

- **Chongqing-Euro Passageway**

PRC, Kazakhstan, Russia, Belarus, Poland and Germany;
These six countries' GDP is about \$ 1.44 billion, and the total population is 1.64 billion in 2012.

Trade in goods and services exports are close to \$ 5 trillion, accounting for 44% of the total exports of Silk Road Economic Belt

- **Central Passageway**

1.3 million kilometers long;

Countries along this passageway are nearly \$ 15 trillion GDP, accounting for 53% of Silk Road Economic Belt.

- **PRC-India-Bangladesh-Burma Passageway**

Delhi-Dhaka-Mandalay-Kunming-Chongqing-Euro Passageway
which is about 4000 km long

- **Air Express Passageway**

Beijing-Moscow-Berlin-Paris-Istanbul and other Chinese, European and Mediterranean aviation hub of international direct flights

Yinchuan - Karachi - Dubai - Cairo and other cities as hubs of Islamic culture passenger routes.

- **Sea Transportation Passageways**

Recent focus on PRC-ASEAN maritime cooperation fund projects, Eventually forming Shanghai - Hong Kong, China - Singapore - Calcutta - Mumbai - Karachi - Cairo passageways, which will pass through the Suez Canal and the Mediterranean, and arrived at Rotterdam.

2.3.3 Pluralism Transportation Networks and form 7 transportation economic belts

• Pluralism Transportation Networks

Construct 11 sea-air transit hubs, bridging land, air and maritime lanes and formation Silk Road transportation networks.

Land-sea hubs: Rotterdam, Karachi, Mumbai and Dhaka

Sea-air hubs: Dubai and Cairo

Land-air hubs: Beijing, Moscow, Berlin and Istanbul

• Transportation Belt with 7 economic zones

East Asian economic zone : In PRC, two vertical and three horizontal transportation network connects the Yangtze River Delta, Beijing-Tianjin-Hebei, the Pearl River Delta, Chengdu city group, Shanxi plain urban agglomeration and Central plains urban agglomeration;

Central Asian economic zone: Almaty-Tashkent-Dushanbe-Ashgabat

Middle East economic zone: Tehran and Baghdad as the core

Mediterranean economic zone: Istanbul as the core

West European economic zone: Berlin as the core, and Rotterdam as the maritime gateway, Warsaw, Budapest and other cities of Western Europe as nodes;

Middle-Eastern European economic zone: Moscow as the core, and Minsk, Kiev and other cities in Eastern Europe and Volgograd, Baku and other cities in Central and Eastern Europe as nodes;

South Asia economic zone: Dhaka and Calcutta as the cores, extend westward to the Delhi metropolitan area, and eastward to the Mandalay and Kunming.

2.4 The development mode of international tourism economic belt along Silk Road

2.4.1 Building the Silk Road international tourism union and international ecological and cultural tourism belts to improve the regional cooperation mechanism

- building the Silk Road international tourism union to improve the regional cooperation mechanism;
- building international ecological and cultural tourism belt, route and product by exploring, packaging, and designing the local tourism resources;
- holding international tourism cooperation forum annually or biannually to create the Silk Road ecological and cultural tourism brand images and to promote different industries integration ;
- tourism industry in Silk Road will become the forerunner industry and international tourism cooperation will become the priority area in Silk Road sustainable development;
- international tourism economic belt will undoubtedly evolve into an important international strategic passage to strengthen overall competitiveness of regional tourism industry.

2.4.2 Building the Silk Road barrier-free tourism zone and special tourism economic zone to push the development of the Silk Road regional economic integration

- **enhancing tourism planning integration, investment policy integration, resource exploration integration, tourism route integration, administrative standard integration, regional market integration, tourism information integration, tourism communication integration, tourism visa integration, clearing form integration to achieve coordinated tourism development in Silk Road ;**
- **exempting from all types of taxes and charges except the profit tax for foreign tourism enterprise;**
- **implementing preferential customs policies for tourist goods, import and export commodity of tourism enterprise in this zone;**
- **implementing special exchange system and flexible visa system for free convertible currency and tourist movement; foreign tourist crossing the this zone could get visa by showing the air ticket.**

2.4.3 Building the cooperation platform of international tourism cities along the Silk Road on the basis of international friendly cities nowadays

- **developing a common strategy for tourist visa openness and facilitation in Silk Road;**
- **increasing the number of international port with visa exemption; implementing multiple-entry visa policy without date-restriction;**
- **opening up international routes, which connect the East Europe and West Europe by multinational aviation network;**
- **improving the quality of road networks from the Central cities to every tourist attraction in this region;**
- **linking up the scattered highway networks in Silk Road; regularly holding international tourism forum and tourism exposition;**
- **developing tourism routes and products together; promoting the international cultural exchange and industry cooperation.**

2.5. Technology cultural cooperation mode

2.5.1. To establish long-term cultural exchanges mechanism of the Silk Road, to improve the international scientific and technological cooperation system and related mechanisms

- Taking the opportunity of joint declaration of natural and cultural heritage of the Silk Road to establish the Silk Road cultural exchange platform, to carry out cultural exchanges activities along the Silk Road Economic Belt, to encourage humanities exchanges along the Silk Road region, and to establish a long-term mechanisms. According to the overall national development objectives, starting from the system, international cooperation in innovation and technology should be guided, managed, and supported through the relevant policies of financial, fiscal, taxation, management and other aspects.

2.5.2 To promote international scientific and technological cooperation through major science and technology projects , and the transfer of cross-border scientific and technological achievements through building science park

- Silk Road, a major science and technology project of transnational economic cooperation, should focus on themes of common interest of current technological challenges and problems of sustainable development in the future. Building technology park and industrial park has become one of the important forms of transnational technology cooperation.

2.5.3. Implement complementary and interchangeable cooperation, and to advance mutual beneficial diversified balanced, safe and efficient technology exchange mechanism

- Developed countries - developing countries: mainly on technical assistance and personnel training, including fields of clean water, food and energy security, infectious disease control, climate change, bridging the digital divide, biodiversity and ecosystem protection.**
- Developed countries - developed countries: focusing on basic research and technology frontier, building large-scale research infrastructure, frontier basic science research and constituting of common standards .**
- Developing countries - developing countries: Exchanges and cooperation in key resources, energy, agriculture, environment and other areas of applied technology.**

3. Priority actions of sustainable development in Silk Road Economic Belt

3.1 Establishing International Consortium of Scientists and Think Tanks in Silk Road Economic Belt

- Establishing International Scientists Assemble, which lead by Chinese Academy of Sciences and participate with other National Academies of Sciences and chief scientists in Silk Road.
- The responsibility of this Assemble is to promote the international science and technology cooperation, to give strategic advices and to solve significant scientific problems in Silk Road.

3.2 Establishing International Information Commons and Scientific Policy-making System of ecological environment and sustainable development in Silk Road Economic Zone

3.2.1 Establishing International Information Commons of ecological environment and sustainable development in Silk Road Economic Belt

- Establishing International data center by starting the comprehensive scientific investigation and international symposium of the Silk Road, which are on the basis of resources and environment data sharing service system, CAS.
- The main function of this information commons is to supply the data exchange and sharing service by collecting, organizing, and publishing the basic scientific data in Silk Road.

3.2.2 Establishing Scientific Policy-making System of Silk Road Economic Belt

- This Scientific Policy-making System contain the science research platform of strategic decision, the man-machine interactive system of scientific decision, the scientific information database, the model database of scientific decision, the knowledge database of scientific decision, the model database of scientific decision, and the method database of scientific decision.

3.3 Starting International Science Cooperation and Technology Traineeship Program of Silk Road Economic Belt

- Conducting unscheduled exchanges and communications among scientific research institutions in Silk Road and publishing the research works, which are around the topic of the Silk Road ecological environment and sustainable development.
- Starting the Cavendish program in Silk Road, which need to establish a secretariat and to preside over chairman on duty by each country.
- Starting the transnational scientific expedition and research on the Silk Road Economic Belt
- Enhancing the construction of international talent team and establishing the mechanism of talent's test and evaluation.
- Attaching the importance on the cooperation in transnational talent training and exchange by all the countries along the Silk Road, and implementing the international traineeship program.

3.4. Founding the international cooperation committee in Silk Road Economic belt

- The mission of this committee are discuss the important problem of regional cooperation on sustainable development, and declare the achievement using official document or joint declaration, and act as programmatic document at regional scale. It is a Constraining force for these countries. This committee may attempt at economic domain, once succeed, it may expand on politics, culture and security, formed a regional international committee of large scale and high profile.
- The committee initiates work at three scales
 - **first, convene a leading meeting of the member states periodically, and discuss both cooperation on significant domain and problem on sustainable development.**
 - **Second, conferencing the minister meeting on interoperability and negotiation, aiming at implement former outcome, and make multilateral trust measures and sustainable development scheme.**
 - **Thirdly, sustainable development and harmony office should be set up at each countries, aiming at harmonize the specific transaction among nations, organize multilevel communication and cooperation among various cities, companies.**

3.5. founding transnational construction and win-win cooperation mechanism of coping with climate change and ecological environment

- **We should collaborate hand in hand, reply to the influence of global and extreme events commonly.**
- **Under the background of global and frequently extreme events (typhoon, cold wave, rainstorm, drought), the countries in Silk Road Economic Belt should collaborate friendly, sharing in related technology and information. Industrialized nations should transfer control technologies, and developing nations reduce emissions. Working together with developing nations to develop control technologies and management strategies, industrialized nations can help improve developing nations air quality management capabilities and bring multiple economic and environmental benefits.**
- **Collaboration on ecological restoration engineer, cooperating on control desertification technologies**
- **Using and distribute valued water resource effectively, and cooperate with water-saving irrigation technologies.**
- **Manage transboundary air pollution commonly, build ground-based air pollution monitoring networks, and sharing satellite-based data.**
- **Cooperating on Low carbon technology in the course of urbanization.**

- **Use and distribute valued water resource effectively, and cooperate with water-saving irrigation technologies**
 - **At Silk Road side, half of the zone of mean annual precipitation amount are below 200 millimeter, so water resource is very precious. Under this circumstance related technologies should be cooperate among nations. For instance, Israel has advanced water-saving irrigation and management technologies, other countries may cooperate with it.**
- **Manage transboundary air pollution commonly, build ground-based air pollution monitoring networks, and sharing satellite-based data.**
 - **Activities which increase the capacity in developing nations for managing domestic air pollution problems are the most important actions to be taken in the short term. Developing better emissions inventory and ambient monitoring capabilities is critical for improving the air quality management in developing nations. Such capacity-building steps are among the most important actions that industrialized nations can take in the short term.**
- **Cooperating on Low carbon technology in the course of urbanization.**
 - **International research efforts are needed to quantify source-receptor relationships between nations and to develop integrated analysis tools that connect international transport, climate change, global energy infrastructure, and economic development.**