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Management of Think Tank Research Project Based on Double Helix Structure Theory

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Abstract
To promote the high-quality development of new-type think tanks with Chinese characteristics, better serve the national governance system, and advance the modernization of China's system and capacity of governance, it is necessary to improve the ability of think tanks to organize and manage tasks, and it is important to explore and establish project management paradigms that adapt to the characteristics of think tank research. Under the double helix structure theory, this study deeply analyzes the characteristics of think tank research and project management from the perspective of a professional think tank management team, based on understanding of think tank research characteristics and project management experience. This study proposes suggestions to improve the organization and management capacities of think tanks.

Keywords
think tank; project management; double helix structure; process integration method

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Management of Think Tank Research Project Based on Double Helix Structure Theory

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Abstract: To promote the high-quality development of new-type think tanks with Chinese characteristics, better serve the national governance system, and advance the modernization of China’s system and capacity of governance, it is necessary to improve the ability of think tanks to organize and manage tasks, and it is important to explore and establish project management paradigms that adapt to the characteristics of think tank research. Under the double helix structure theory, this study deeply analyzes the characteristics of think tank research and project management from the perspective of a professional think tank management team, on the basis of the understanding of think tank research characteristics and project management experience. This study proposes suggestions to improve the organization and management capacities of think tanks. DOI: 10.16418/j.issn.1000-3045.20201120001-en

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1 Particularity of think tank research projects and their management

Think tank research projects are significantly different from general scientific research projects or engineering projects. Scientific research projects are set up to promote discipline construction and improve science and technology, so as to meet social needs and develop the national economy. Scientific research projects include basic research and applied basic research projects, technology research and achievement transformation projects, and application demonstration projects. With engineering construction as the carrier, engineering projects have specific target outputs. Engineering projects should be completed in a specified time in accordance with procedures and should meet quality requirements, such as tracks, highways, tunnels, railways, and subways. The differences of think tank research projects from scientific research projects and engineering projects are mainly reflected by three characteristics of think tank research projects. Results of think tank research projects serve decision-making. Think tank research projects serve national macro policy-making and solve problems of public policies and development strategies. On the one hand, this requires project teams to establish effective communication platforms and mechanisms with policy-making departments. On the other hand, this requires think tank researchers to have systematic thinking as well as the mind and wisdom to serve national macro policy-making. Think tank research projects have strong timeliness. They should provide decision-making suggestions for the CPC Central Committee, the State Council, national ministries, and local governments. Thus, think tank research projects should focus on solving practical problems and give systematic policy suggestions within the time specified by decision-making departments. Problems to be addressed in think tank research projects are comprehensive. Since think tank research has convergent characteristics such as interdisciplinarity, interconnectedness, policy practicality, social impact, innovation, and uncertainty, it should integrate views and perspectives of different disciplines to provide systematic solutions. Therefore, think tank research projects must develop a mode that experts from different disciplines participate in research. Meanwhile, think tank researchers are required to be competent in the research of comprehensive issues. They should be versatile talents with coordinated, cooperative, comprehensive, integrative, and professional abilities. On the basis of the characteristics of think tank research projects which are different from those of scientific research projects and engineering projects, we believe that it is important to explore the project management model suitable for the characteristics of think tank research.

Theoretical methods of think tank research are the foundation and basis of the management of think tank research projects. On the basis of systematic studies on the basic logic system and methodology of think tank research, Pan, the president of the Institutes of Science and Development, Chinese Academy of Sciences (CAS), proposed a double...
helix structure of think tank research. Under the inherent requirements of problem-orientation, evidence-orientation, and science-orientation of think tank research, the double helix structure of think tank research is a whole composed of outer circulation and inner circulation. The outer circulation refers to the analysis of the “question decomposing-interdisciplinary research-regression” process, and the root of the knowledge layer of think tank research from an overall perspective. The inner circulation consists of two loop-iteration helix structures. One is the “process convergence method” based on “data-information-intelligence-solution” (DIIS), and another is the “logics layer method” based on “mechanism-impact-policy-solution” (MIPS). The two helixes both start with problem research and end with solutions. This theory is a systematic and pioneering exploration for paradigms of think tank research. It provides methodology and practical tools for practice of think tank research and also offers a systematic cognitive perspective and theoretical basis for analysis and discussion of the management of think tank research projects. From the perspective of the management of think tank research projects, the outer circulation forms overall research programs of think tanks, while the inner circulation is specific links and implementation methods of solving think tank problems. This double helix structure is not only a research method for think tank problems but also has important management implications.

The process convergence method based on DIIS focuses on research links, and the logics layer method based on MIPS emphasizes the research logic. This paper deeply analyzes the management process of think tank research projects on the basis of the DIIS-based research link theory. For the sake of the optimization of the management of think tank research projects, from the perspective of a professional think tank management team, this paper deeply analyzes think tank project research under the outer circulation system and the inner circulation system, summarizes experience in the management of think tank research projects of the Institutes of Science and Development, CAS, and provides suggestions to improve the management capability of think tank tasks on the basis of project management experiences since the pilot project of high-end think tanks was carried out in 2016.

2 Think tank project research under the outer circulation system

On the basis of the research logic theory of “question decomposing-interdisciplinary research-regression” of the outer circulation in think tank research, this paper deeply analyzes the management process of think tank research projects and the role of think tank management teams in the research logic process of “question decomposing-interdisciplinary research-regression” by analyzing think tank projects carried out by the CAS.

2.1 Question decomposing

When conducting think tank research, we first decompose complex think tank problems into a group of clear and operational subproblem sets by the analytical theory and existing knowledge. In the question decomposing process, if the problem decomposition is more specific, detailed, and scientific, the subsequent research would be more targeted [3]. In project management, teams can use three methods to analyze think tank problems: the parallel element method, the progressive chain method, and the core focusing method.

(1) Parallel element method. This method decomposes the major issues of think tank research into a number of equally important subproblems according to fields, definitions, and other elements, and treats the subproblems as complete think tank problems to study in parallel. For example, when carrying out study on ethical governance problems in emerging scientific and technological fields, we can divide the emerging scientific and technological fields into gene editing, artificial intelligence, and other fields, and then conduct parallel research on these fields. This method decomposes an abstract systematic problem into relatively specific problems belonging to different fields, providing directions for research. However, research teams should fully communicate with clients before using this decomposition method, in order to avoid missing key elements required by decision-making in the research.

(2) Progressive chain method. Some think tank problems belong to emerging concepts or are new governance issues with Chinese characteristics. Researchers lack historical and international experience to draw on, and these problems are difficult to decompose into clear subproblem sets on the basis of their characteristics. For such problems, the progressive method is adopted for derivation. We can explore current situations from inner mechanisms, identify trends and problems from current situations, analyze difficulties and challenges from problems, and finally propose policy suggestions to address challenges. These steps are interlocked. Different from the parallel element method, the progressive chain method cannot study subproblems simultaneously after the decomposition of a problem. It requires researchers to organize ideas to deal with the next subproblem in a timely manner after solving one subproblem. Therefore, research teams should establish an effective real-time communication mechanism.

(3) Core focusing method. In the core focusing method, the first step is to explore key scientific issues behind think tank problems, namely to analyze prominent contradictions and key blockages behind these problems so as to discover and extract the core problem that restricts development. The second step is to deeply study the connotation and essence of the core problem, sort relevant historical and international experience, and analyze related industrial and policy practices. The third step is to propose countermeasures and suggestions to cope with the core problem. For example, when
studying institutional issues of science and technology, researchers should first confirm the key point of the institutional reform of science and technology is resource allocation, and then focus on how to solve the resource allocation problem, so as to put forward countermeasures and suggestions to promote the institutional reform of science and technology. When we use the core focusing method, we can also use the parallel element method and the progressive chain method to re-analyze the core problem.

It should be noted that think tank problems are usually complex systematic problems, which makes single analytical methods difficult to provide complete ideas. Commonly, think tank research combines three analytical methods and applies them in a cross manner, so as to form a complex analytical method that fits the characteristics of think tank research. For example, after question decomposing in parallel, researchers re-decompose subproblems with the progressive chain method and the core focusing method to form subproblem sets at multiple levels. Moreover, the three analytical methods all require research teams including four kinds of experts: theoretical experts who focus on mechanisms and laws, information experts who sort international and historical experience, management experts who propose challenges in fields and industries, and policy experts who extract corresponding countermeasures and suggestions. The four kinds of experts solve the subproblem sets one by one through cooperation, laying a solid foundation for interdisciplinary research and regression research.

2.2 Interdisciplinary research

Management teams of think tanks should organize scholars from different disciplines and with professional backgrounds to conduct interdisciplinary research. The interdisciplinary research mainly includes three ways: team integration, discipline integration, and problem integration.

(1) Team integration. With the parallel element method as an example, research teams using this analytical method usually study subproblems simultaneously by the division of labor. Whether a team is divided according to the categories of theory, information, management, and policy, or according to different disciplines, team integration is necessary, so that team members can obtain new information and cognition through knowledge exchange. For example, after sorting historical and international experience, information experts should fully communicate with policy experts to gain insights by combining the sorted experience and national policy practices. Technical experts can draw on the problems encountered by management experts in industries and specific practices to obtain technical routes that better meet actual needs. Team integration is a process that the team re-considers the whole core problem as a breakthrough point after team members conduct studies separately.

(2) Discipline integration. Scientific and technology think tank problems are generally interdisciplinary. Thus, researchers need to organically integrate theories, methods, and paradigms of different disciplines. For example, when studying national development strategies, researchers should fully consider multidisciplinary issues such as economic, social, scientific and technological, educational, financial, and resource issues that development may encounter in each subproblem. These issues are indispensable and closely related. Researchers should thoroughly understand correlations among key elements such as human resources, education levels, environmental resources, science and technology innovation, and financial risks that constrain and promote each other, so as to provide systematic policy suggestions for think tank problems.

(3) Problem integration. Subproblems usually have high correlations and strong intersectionality. Thus, the integration of subproblems is an important prerequisite for a deeper understanding of the core problem. After collecting data and literature based on subproblems and conducting preliminary analysis, researchers should re-integrate the data and literature through quantitative and qualitative research from the perspective of answering systematic problems. Different analytical methods match with different problem integration methods. For example, the progressive chain method usually adopts a retrospective problem integration method, which integrates new findings of the current stage with those of the previous stage. The parallel element method usually uses the comparative problem integration method to compare different problems under the same perspective. The problem integration is the most critical step before the regression of problems.

2.3 Regression

On the basis of the interdisciplinary research, researchers should use the reductionism for the regression of subproblems in problem sets to the think tank problem itself, and then obtain the solution to the problem through loop, iteration, and integration. Problem regression has a profound impact on the quality of think tank research achievements. Some think tanks have a high level of research but lack the ability to transform think tank achievements. This makes the policy suggestions not practical. The main problem is that research teams do not put forward targeted and focused policy suggestions during problem regression.

On the basis of the experience in management of think tank research projects in recent years, the Institutes of Science and Development, CAS divides think tank topics into four categories: development strategies at the national level, development paths at the industrial level, work programs at the department level, and theoretical research leading frontier directions. This study summarizes different emphases of the four types of research topics in problem regression and the ways to give useful and practical solutions with high transformation rate in the management practice of think tank research projects.

(1) Development strategies at the national level. Research on development strategies at the national level requires think tanks to provide countermeasures and suggestions on major
issues, key areas, and important events in the national development from the macro level. This type of think tank research should propose general ideas, basic directions, and major implementation paths at the national level, and focus on development plans and strategic paths at the macro level. The proposed macro policy suggestions should be global and strategic, which can comprehensively and systematically address major national development issues.

(2) Development paths at the industrial level. The study issues about development paths at the industrial level include development paths of emerging industries, transformation and upgrading of traditional industries, and research paths of core technologies in key industries. This type of think tank research projects requires think tanks to deeply investigate current situations, development trends, problems and challenges encountered by industries, and to propose countermeasures and suggestions which can reflect characteristics of industries and accurately solve problems. For this kind of policy suggestions, think tanks should first focus on accurately grasping development situations of industries and technologies, so as to propose paths and suggestions aiming at characteristics and challenges of industries. The proposed policy suggestions should be professional, accurate, and timely, and can provide ideas for the development of industries.

(3) Work programs at the department level. For problems in specific work programs of departments such as bill revision, division of main responsibility, and improvement of governance systems, policy suggestions should focus on the implementation of main responsibility, laws and administrative regulations, funding input mechanisms, and other elements closely related to the work of departments. Think tanks should target relevant elements and key areas to put forward countermeasures and suggestions that closely follow clients’ requirements. The proposed policy suggestions should be novel, specific, and highly operational, and the work programs provided for decision-making departments should be practical.

(4) Theoretical research leading frontier directions. For theoretical issues in emerging fields and concepts such as measurement research on economic development driven by new power, policy suggestions should focus on innovative research ideas, solid theoretical foundations, scientific research methods, and detailed research data. Researchers should propose countermeasures and suggestions at the theoretical forefront. The proposed policy suggestions should be scientific, creative, and practical, and can provide a theoretical reserve for China’s innovation-driven development path.

3 Think tank project research under the inner circulation system

The inner circulation of think tank research consists of two loop-iteration helix structures on the basis of the DIIS-based process convergence method and the MIPS-based logics layer method. The former method focuses on research links and the latter emphasizes research logic. On the basis of the DIIS-based research link theory, this paper analyzes the management process of think tank research projects and the role that think tank management teams should play in DIIS research links.

3.1 Data

Decision-making consultation research has high requirements for timeliness and accuracy of data. Whether researchers can collect the most real-time, complete, true, and accurate data will greatly affect the quality of research results. In the data collection stage, researchers collect and summarize relevant information from the Internet, databases, literature, and other related materials, and then organize the basic information in a structured way through data cleaning, text mining, and artificial cognition. Think tank research usually adopts questionnaire survey, interview survey, field survey, and literature and data collection to collect basic materials of topics.

References and statistical data of think tank project research are mainly obtained from five types of institutions or organizations: (1) government agencies: official databases and reports of government agencies, such as databases of national bureau of statistics of different countries, strategic plans, action plans, and annual reports issued by government agencies; (2) literature data platform: databases of authoritative literature in different disciplines, including journals, conference papers, series, and patents, such as China National Knowledge Infrastructure (CNKI), Web of Science, and Scopus; (3) international organizations or institutions: databases managed by intergovernmental and non-intergovernmental international organizations and reports published by them, such as the database of the Organization for Economic Co-operation and Development (OECD), the database of the International Monetary Fund (IMF), Statistical Yearbooks of the United Nations, and the database of United Nations Statistics Division; (4) professional research center: latest research reports released by professional research centers as well as open and sharing databases, such as annual research frontier reports issued by the CAS and the database of McKinsey Global Institute; (5) industry associations and alliances: research reports and industry data issued by industry associations of different fields, such as industry development white papers released by the China Association of Communication Enterprises and the China Association of Automobile Manufacturers.

For the government data that are not open to the public, think tank management teams can establish information-sharing mechanisms with various functional departments to assist research teams to obtain the most timely and complete basic information. For paid databases, think tank management teams should fully communicate with research teams and try to provide resources to assist research teams in
obtaining necessary critical data. Moreover, think tank management teams should integrate resources so that researchers can collect information more easily, comprehensively, and efficiently.

3.2 Information

After collecting materials and data, think tank research teams grasp key information from basic materials to obtain key variables, changing trends of the variables, and typical samples of topics, thus forming preliminary solutions. The key information produced at this stage lays the foundation for research results.

Think tank research teams generally use quantitative and qualitative methods as well as the methods combining these two to conduct horizontal, vertical, crossover, and commonality analyses, so as to obtain key issues, core elements, and development trends of think tank research topics from available data. Quantitative research methods include regression analysis, cluster analysis, and time series. Qualitative research methods include content analysis, case study, and analogical learning. Qualitative and quantitative combined methods include multivariate research methods (such as analytic hierarchy process and citation analysis) and the methods combining qualitative and quantitative approaches. The methods that are selected in practice depend on the type of available data and information.

Think tank management teams should integrate large-scale computational analysis tools, qualitative research tools, and other tools supporting research (such as document management tools and drawing software) that are commonly used in think tank research, so as to build a tool sharing mechanism for think tank research. Meanwhile, databases of think tank experts with high academic levels should be established to provide methodological guidance and suggestions for research teams and to ensure that the used research methods are scientific and research ideas are innovative.

3.3 Intelligence

After obtaining key issues, core elements, and development trends, researchers further verify and infer the identified issues, elements, and trends at the intelligence stage, in order to provide a basis for proposing solutions. This stage consists of two parts: professional judgment and consultation from experts.

(1) Professional judgment methods. Researchers use professional and comprehensive judgment methods, such as the science and technology roadmap method, the evidential reasoning method, and the econometric regression method, to further quantitatively and qualitatively verify the new perception developed during the information stage. For example, literature and data analysis reveals basic trends of situations in the information stage; in the intelligence stage, researchers use the econometric method to further quantify the trends and analyze their influences on China’s economic development and other correlations, thus providing an important basis for proposing solutions.

(2) Consultation from experts. By consulting experts, researchers introduce the wisdom of experts to judge the new perception, so as to obtain new understanding, new frameworks, and new ideas. Consultation from experts can be carried out in various forms, such as one-to-one interviews and evaluations online or offline, consultation meetings, and symposia. Think tank management teams need to integrate resources and invite experts to participate in the consultation and judgment, including professional managerial staff from policy-making departments, senior researchers in relevant fields, technical and managerial staff from private sectors, and officials and policy implementers from local governments, so as to fully gather the wisdom of experts from all parties.

3.4 Solution

After the intelligence stage, the overall understanding and solving ideas of think tank problems are basically formed. The goal of the final stage is to form practical, constructive, and comprehensive policy suggestions. In the management process of think tank research projects, it is found that high-quality solutions are generally problem-oriented, evidence-oriented, and science-oriented.

(1) Problem-oriented. General Secretary Xi Jinping pointed out that all valuable and meaningful literary and artistic works and academic research should reflect reality and be conducive to solving real problems and answering real questions. Think tank research achievements should be problem-oriented. At the stage of solution formation, researchers should maintain close communication with clients to discuss the feasibility of proposed schemes and effectively answer think tank problems raised by clients, thus providing useful and practical solutions.

(2) Evidence-oriented. Think tank research achievements are important references for national development, industry development, and departmental work, which must be feasible, rigorous, and reliable. At the solution formation stage, researchers should conduct sufficient expert argumentation and evidence verification. In addition, they should ensure thinking modes to be logical, policy tools properly applied, research methods scientifically selected, and solutions evidence-based, thus guaranteeing that the think tank research is rigorous and evidence-oriented.

(3) Science-oriented. Science and technology think tank research should be scientific-oriented and focuses on innovative thinking, long-term consideration, and independent ideas. It should provide forward-looking suggestions and systematic solutions through scientific theoretical methods. At the stage of solution formation, researchers should focus on novelty, foresight, robustness, and independence of solutions, and propose highly innovative solutions, development trends facing future, and schemes with the consideration of uncertainties, so as to guarantee professional, neutral, and realistic think tank research.
4 Management idea of think tank research projects following laws of think tank research

As the construction of China’s high-end think tank pilots has entered the stage of high-quality development, requirements become higher for professional management capacity of think tank projects. On the basis of the management practice of the Institutes of Science and Development, CAS for think tank research projects and its consideration of basic logic of think tank research in the past four years, we propose the following suggestions for the management capacity building of think tank research projects.

4.1 Management practice of the Institutes of Science and Development, CAS for think tank tasks

(1) Building professional management teams for think tank research projects. Since professional think tanks require professional staff, the Institutes of Science and Development, CAS has set up a department responsible for managing think tank research tasks. This department selects experts and organizes teams to carry out think tank research aiming at requirements of think tank research tasks to promote the construction of networked teams of think tank research. Moreover, this department communicates with national decision-making departments to integrate and report important research achievements. It improves think tank research results by continuously improving the organization and coordination ability of think tank research projects.

(2) Establishing a standard management system of think tank research projects. It is difficult to produce high-quality think tank research results continuously in the absence of a standard management system of think tank research projects. The Institutes of Science and Development, CAS summarizes the whole-process management system of think tank research projects, i.e., “making plans-decision communication-tracing and feedback-check and evaluation-submission.” The Institutes puts forward requirements for project organization, research teams, process standards, critical nodes, and funding settings, and particularly proposes specific standards that conform to the laws of think tank project research and ensure the quality of research results. For example, researchers should rigorously follow timelines of project schedules, communicate with assignment departments during the research process, and strictly follow the composition rules of experts in each review link. Standard management schemes improve the cooperation between management and research and promote more excellent research results.

(3) Building networked think tank research teams. By effectively coordinating resources and breaking traditional restrictions of subject groups and departments, the Institutes of Science and Development, CAS selects think tank task researchers throughout the institutes and mobilizes scientific staff with different disciplinary backgrounds to join project teams. Moreover, by encouraging teamwork and combining researchers inside and outside the institutes, the Institutes of Science and Development, CAS forms project expert teams composed of field experts, policy experts, and management experts and establishes networked think tank research teams.

4.2 Suggestions for promoting and improving the management of think tank research projects

Think tank research projects are carriers of think tanks’ policy consultation capabilities. The management of think tank research projects should make efforts on six aspects: “establishing platforms, promoting fusion, focusing on reserves, organizing teams, optimizing transformation, and strengthening integration.” Think tanks should optimize research elements with scientific project management ideas and play a supporting role in serving government decision-making and promoting economic and social development.

(1) Promoting platform establishment of think tank research and improving comprehensive analysis ability of decision-making and consultation. Think tank research platforms are the foundation and support of think tank research, among which data platforms and tool platforms are important tasks in the construction of think tank platforms. As a new production factor, data will play an important role in promoting the construction of science and technology think tanks. Combining the big data technology and think tank research closely and supporting decision-making and consultation with big data are important directions for science and technology facilitating national decision-making in the post-pandemic era. Tool platforms refer to analytical model tools, decision analysis tools, etc. in think tank research. The establishment of tool platforms is beneficial for promoting scientific and standardized think tank research.

(2) Promoting interdisciplinary integration of think tank research and forming comprehensive policy suggestions. Decision-making consultation requires a comprehensive perspective. Think tank research should strengthen the integration of different disciplines and avoid putting forward one-sided policy suggestions due to the treatment of new problems and contradictions from a single perspective. The academic backgrounds of the research teams should be reasonably matched with the research projects to form teams for comprehensive and integrated research. Experts from different directions and fields should be invited to fully discuss think tank research results, propose solutions and potential risks from different perspectives, and carry out multi-scenario analysis, so as to provide comprehensive references for policy suggestions.

(3) Deploying forward-looking reserved topics and releasing research creativity based on decision-making frontier. Think tanks should establish research systems that place equal emphasis on task-oriented research and forward-looking research, arrange major topics reflecting development laws and trends, and strengthen the reserve of think tank research capability. On the one hand, think tanks
can compile topic selection schemes of think tank research projects based on national and international events as well as situation prediction, so as to strengthen predictive research. On the other hand, on the basis of the previous research foundation, think tanks should actively explore new fields to form reserved research directions and power.

(4) Establishing networked think tank research teams and improving the quality of research results by integrating efforts and wisdom. The greatest advantage of think tank construction is rich intellectual resources, including high-level research teams and experts with rich experience in decision-making and management. Think tanks should improve the mechanism of “revolution door,” establish criteria and methods for identification and evaluation of think tank talents, and open the “revolving” channel for research staff. As a result, think tanks can increase the strategic level of think tank research related to policies, improve the transformation rate and effectiveness of think tank research achievements, and accelerate the training of young researchers in decision-making thinking and paradigms.

(5) Improving transformation of research achievements and strengthening communication with policy-making departments. The channels for think tanks reporting to national relevant decision-making departments should be explored. By positively receiving research tasks, co-organizing academic forums, and jointly establishing institutionalized research platforms, think tanks transform achievements with decision-making consultation value into decision-making consultation reports. Think tanks should fully use online resources, such as official websites, WeChat, and other online platforms to publish research results and guide social opinions. In project management, think tanks can invite personnel from relevant departments to join research teams to improve the feasibility of decision-making results.

(6) Strengthening the integration of research achievements and improving management level of think tank research projects. Management departments of think tank research projects should improve the integration ability of research results: ① focusing on problem decomposition in the project research to extract important ideas; ② comprehensively considering decision-making requirements to connect study reports with decision-making requirements and conduct regression of study results to decision-making problems; ③ transforming study results and think tank reports to form policy suggestions or schemes suitable for decision-making applications.

References

(Translated by ZHANG XY)

LI Yingming Researcher of Institutes of Science and Development, Chinese Academy of Sciences. Her research mainly focuses on S&T development and sustainable development. Research topics include technological innovation, environmental governance model, green technology transformation path, climate change, agricultural sustainable development, and think tank method. She has published more than 50 academic papers in System Engineering Theory and Practice, Chinese Journal of Management Science, Journal of Industrial Engineering and Engineering Management, Journal of Cleaner Production and other Journals. She has obtained grants from a number of fund projects, such as Major Projects of Social Science Fund and General Projects of National Natural Science Foundation of China. She has organized and accomplished many think tank research tasks assigned by national