Chapter 4
Problem-Oriented Technology Innovation and Participatory Technology Assessment in China

Chunfang Zhou
Aalborg University, Denmark

Lars Bo Henriksen
Aalborg University, Denmark

Søren Kerndrup
Aalborg University, Denmark

ABSTRACT

China is developing an 'innovation-oriented nation' and meanwhile meeting challenges in both innovation practice and research. This chapter contributes to the book that introduces a problem-oriented approach to develop innovation research to a Chinese context that responses to the increasing challenges. Three questions will be focused on: 1) What are the main problems and challenges of innovation and research in China to become a front runner in the knowledge economy? 2) What is a problem-oriented innovation approach? and 3) How does it conceptualize the China's innovation challenge? Briefly, this chapter deepens the understanding of a new conceptual framework of a problem-oriented approach to innovation research and suggests new methods of technology assessment to China. It also provides implications for researchers in other cultural contexts around the world.

DOI: 10.4018/978-1-7998-2385-8.ch004

INTRODUCTION

Over the past three decades, China has made two historic transformations: the nation firstly developed itself from a rural, agricultural society to an urban, industrial one, and then changed the society from a command economy to a marked-based one (Jing & Osborn, 2017). Today, the shift from 'Made in China' to 'Created in China' demands a very deep transformation of the way of innovation is performed. Innovation in industrial economic in China largely concerns what a traditional Chinese Marxist scholar might call the 'productive forces', namely the combination of natural resources, government policy, competitive markets, infrastructure, human capital, and business strategy. In a knowledge economy, innovations are increasingly based on aggregated inputs of 'capital': intellectual capital, structural capital, technological capital, human capital, and cultural capital, etc (Zhou, 2019). In such changes of the innovation capabilities, culture is also playing a leading role, and policies are important levers for managing the transition of the innovative capabilities and inclusion of costumers and citizens.

The literature (Zhou, Rasmussen, Luo, & Chemi, 2017) shows in 1998, China officially adopted the concept of the National Innovation System; thereafter, the design and implementation of science and technology (S&T) policies has focused more on accelerating the progress of S&T and strengthening technical innovation and high-tech industrialization. In 2006, 'innovation-oriented nation' became an officially recognized national strategy of China, after decades of active engagement in the world's economic system and the successful establishment of China's competitive advantages in primary industries and manufacturing. Such a policy became more urgent when China became the second largest sovereign economy in 2010. But the innovation systems with Chinese characteristics still struggle with inclusion of SME's, employers, and citizens.

The general consensus that for a country of China's size and diversity, it needs competence at all stages of the production chain and value chain (Jing & Osborn, 2017), but there is lesser focus on need of inclusion of stakeholders as employees, user and citizens. In the report China 2030 (The World Bank, 2013), it describes that if managed well, China could become a modern, harmonious, creative, and high-income society by 2030. Compared with today, China's economy in 2030 will be more complex, market driven, knowledge centered, and oriented toward services. Accordingly, in the long run, the objective should be to develop an inclusive system that stimulates broad-based creativity, innovation and stakeholders. However, the new strategies will need to be developed on the existing capabilities in the whole society, which will be more inclusive in order to include stakeholders who are today standing outside the system of research institutions and big companies (Zhou, 2019).

Therefore, how to manage the challenges should be focused more on the way of making innovation research more inclusive and open, which benefits to develop new strategies for the future. However, what are those objectives, and what kind of new strategy does China need to achieve? Recently, these issues have been reflected by a growing number of studies on 'China Innovation' in the literature. For example, Taj (2008) highlighted the application of lean production is a good strategy to improve Chinese manufacturing firms' performance and competitiveness; Gima and Murray (2007) emphasized the effects of the structural, relational, and cognitive dimensions of social capital on exploratory and exploitative learning in new product development in new ventures in China; Li (2011) suggested creativity is very essential for the current transformation of China's economy and therefore a series of suggestions are proposed for developing creative industries, creative cities, creative communities and creative society; and Jing and Osborne (2017) argued that the coming of the era of China' growing sets a new and complex context and so the public service innovations should be paid more attention than before. From these