

Review

Framework for Analyzing State Intervention in the Global Rice Production Sector

Iraj Malekmohammadi, Seyed Jamal Farajollah Hosseini, Saeed Yazdani and Shahin Shadfar*

Department of Agricultural Development, Science and Research Branch, Islamic Azad University, Tehran – Iran.

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States are interfering in all economic sectors. States intervention is an accepted driven factor in many developing countries. On the other hand, rice is half of the world's population food. In addition, rice self-sufficiency is the desire of many Asian countries where rice is a food security matter. This paper is about state intervention in major rice producing countries, and how to identify common areas of state intervention in rice production development. Different state policies in rice sector in world top rice producing countries are reviewed and compared. Based on the universally explored policies affecting rice production, the global theoretical model for the state intervention is proposed to secure rice production increase/development.

Key words: Rice production development, state intervention, policy making model.

INTRODUCTION

In the new modern dawn, the states at every level and in all regions of the world are accountable for magnificent growth, rapid economic development in some countries as well as changes toward far-reaching economic and social developments in recent years. Experiences from last 50 years can proof the importance and strategic position of the state policies toward growth and development in developing countries where states are normally fat and bureaucratic. State expenditures in developing countries have been increasing annually, from 15% of GDP in 1960s to more than 30% in 1990s (Anonymous, World Bank, 1999). Yet despite diversity of origins, states over time came to acquire several common and defining features worldwide, over time. Modern states have a consolidated territory and population, and within these, they play centralizing and coordinating role. The configuration of the states has varied widely across continents and centuries, but arguments over the proper roles of the state in public and private spheres (Anonymous, World Bank, 1999).

In developing countries, states are interfering in all economy sectors and all the businesses. The states are

controlling the economy actively and directly by monetary tools like fiscal budgets making laws and policymaking and by the other non-commercial and non-monetary tools and activities. Through long past time, state concept and roles have been drastically changed. In recent years, more services had been expected from governments, having said that some times expectations have been too much. Clearly, the general mood is changing to have different type of the state plans in very new perspectives, new structure and new attitude to develop economy and its sub-sectors. Hence, some economists like Evans believe that sterile debates about 'how much' states intervene have to be replaced with arguments about different kinds of involvement and their effects. Contrasts between 'dirigiste' and 'liberal' or 'interventionist' and 'noninterventionist' states focus attention on degree of departure from ideal-typical competitive markets. They confuse on the basic issues. In the contemporary world, withdrawal and involvement [of the state] are not the alternatives. State involvement is a given. The appropriate question is not 'how much' but 'what kind' (Evans, 1995).

It has been estimated that half of the world's population subsists wholly or partially on rice. For them, rice is life. The grain has shaped the cultures, diets, and economies of billions of people in Asia, Africa and Latin America. For

*Corresponding author. E-mail: shahin.shadfar@gmail.com.

Table 1. Rice production by continent.

Continent	Rice production (million tons)	Global production share (%)
Asia	574.2	91
South America	22.6	3.6
Africa	20	3
North America	11.1	1.4
Europe	3.4	1.0

Source: International trade commodities, 2009.

Table 2. Top rice producing countries.

Country	Rice production (million tons)	Global production share (%)
China	182	28.8
India	136.5	21.6
Indonesia	54.4	8.6
Vietnam	35.8	5.7
Thailand	29.4	4.6
Philippines	15.3	2.4
United States	8.8	1.4
South Korea	6.3	1.0
Malaysia	2.2	0.3

Source: International trade commodities, 2009.

Asians, life without rice is simply unthinkable. It is estimated that between now and 2020; 1.2 billion new rice consumers will be added in Asia only. Feeding these people will require the greatest effort in the history of agriculture; which means rice production must be increased by one third from today's 320 million tons to 420 million tons. Farmers will have to grow an extra 3.7 million tons every year—at the very time that rice land is decreasing and the remaining fields seem to be wearing out (Anonymous, Asia Rice Foundation, 2010). As a human food, rice continues to gain popularity in many parts of the world where other coarse cereals, such as maize, sorghum and millet, or tubers and roots like potatoes, yams, and cassava have traditionally dominated. For example, of all the world's regions, Africa has had the sharpest rise in rice consumption during the last few decades (Kiple and Ornelas, 2000). Economic and cultural importance of rice as well as its crucial role in food security has turned rice to extremely "strategic product" along with wheat in many developing countries, including Iran. Table 1 shows the rice production break down by continents in the world and Table 2 shows rice production in top rice producing countries in the world in 2009. As the staple food for the overwhelming majority of the population, rice is ultimately a food security concern in Iran as well as in many developing and poor countries; therefore, it is clear that the government's duty to provide substantial intervention in terms of both regulation and support is indispensable. The high relative importance of

rice as commodity is traceable to its linkage with poor in developing countries, where roughly, three-quarters of a billion of the world's poorest people depend on rice (Abasolo et al., 2009). Changes in farming practices, driven by water and labor shortages, are affecting the agricultural resources in many developing countries. The physical environment is also changing.

There is less available water, less and less arable land for cultivation, more carbon dioxide in the air, and atmospheric temperatures appear to be rising (Sarris, 2005). Overall, much uncertainty still exists about the true direction of the impact of CO₂ and temperature on rice yields. Change on rice quality will occur from higher temperatures, which will affect several quality traits, including chalk, amylase content, and gelatinization temperature. The positive effects of elevated CO₂ do not compensate for the overall decrease in rice quality from the effects of global warming (Anonymous, Rice Today, 2007). Nevertheless, climate change will affect rice crops in the following manner or direction; higher temperatures will reduce yields, flooding will increase exposure to lethal submergence, and drought may well increase in frequency in critical areas. Therefore, states should quickly respond to these challenges. Many studies have shown that government intervention invariably played a critical role in many countries. The state interventions are to ensure the continued viability of rice production and guaranteed sufficient number of farmers would continue to plant enough rice to feed the population. Under the

framework of continuing state intervention, options for developing rice production to meet domestic requirements are not very much different. Finding the appropriate formula comprising production related and market-based interventions determine whether the goal of achieving self-sufficiency (desire of many developing countries as well as Iran) would ultimately be realized. It has been said that Iran was one of the first countries where farming and civilization started; and first time in Iran plateau, people started agriculture, farming and livestock (Derakhshan, 2005). Increasing rice plants and efficiency in production are the main index to study rice development as one of the key factors in alleviation of poverty and battle against hunger in Iran. Rice is one of the main food stuffs in Iran and because of its role in food security, social welfare, job creation, environmental stabilization and support sustainable, internal and effective development in the regions that produce it; it needs special attention and more supports from the government (Zareh, 2005). Nevertheless, rice production in Iran has challenges which can be named as natural resources degradations, lack of rural growth and development, low farmers participation in policies and decision making, existing powerful and effective traditional local structures, high risk and cost of production, deficiency in rice industry and lands leveling, fragmented farms, and change of land usage to project businesses (Fallah, 2007).

Nevertheless, the absence of a definite theoretical frame for analyzing, prescribing or evaluating policies of the states in rice sector in Iran is quite clear. This paper is aimed to study common factors of the state intervention policies in rice production development in order to develop structured model for government intervention in rice production. This globalized structure was the outcome of studying the top rice producing countries policies and plans in rice sector. Rice production challenges are strongly affected by many exogenous factors, other than rice production related issues. Emerging new forms of issues which cannot be identified without a strong emphasis on qualitative indicators and improved methods of collecting and combining information for exploratory, evaluation and validation purposes of the problem can mislead the policy and decision makers on the matter. In order to ascertain accurately the real situation in rural areas, rice growers priorities and their contribution, qualitative information from sources such as socio-anthropological studies, values and attitude surveys, market analysis and feasibility studies as well as special studies on key issues such as land and credit access, institutions and participation in rural organizations also should be considered and conducted.

In the past, much of the researches have been concentrated on just a few of these aspects at a time. Understandably, it would be very difficult to solve the

problem analytically integrating all the important variables and their interactions unless many simplifications and assumptions are made at the cost of the real system. In the absence of any analytical model that can simplify the complex systems and serve as an alternative analytical model the efforts of interventions by the government will not yield the expected outcomes. Such a model can be used to understand the intricacies of the system and to study in advance the effects of changes in various internal and external variables in the system (Gupta and Kortzfleisch, 1987). The analytical model takes uncertain inputs that affect economic uncertainty calculations involved. This might help the other developing countries to build up and implement the same structure to ensure desired result; developing rice production and ultimately increase in rice output is achievable.

STATE INTERVENTIONS IN TOP RICE PRODUCING COUNTRIES

Biggest rice producing countries (Table 2) account for more than 70% of total global rice production in 2009. For example China (28.8%) and India (21.6%) accounted for more than one-third of world rice production. In addition to this the two countries are the biggest rice consumers in the globe. The experiences from many of these countries point out active state intervention as crucial factor in the success of rice production. Studies have shown strong state intervention is defining future of the rice economy in these countries. The type of intervention has helped to boost or bust efforts to achieve self-sufficiency and small-scale farmer's welfare. It is interesting to realize that, in some countries, like western countries, where rice is not the main staple food, state intervention is aimed to secure rice producers income, unlike many other Asian countries, where securing rice supply and achieving self-sufficiency is the main goal.

The studies show that continued state intervention was not only desirable but in most cases is necessary. In instances where government support was removed or has been reduced in some rice producing countries, the impact on production has been immediate and later led to the reinstatement of supports (Obanil and Dano, 2005). In general, rice production policies fall within two broad categories. On the one hand, measures directly impinging on production, including research, extension, investment in irrigation and infrastructure, reclamation of new lands or land diversion programs in particular; and on the other hand, market related interventions aimed at stabilizing prices through market procurement and stock management. Policies pertaining to the first category generally address long term objectives often integrated in multi-year development plans or strategies. Market-stabilization measures, on the other hand, are subject to much more frequent changes, depending on prevailing market conditions (Sarris, 2005).

REVIEW OF THE STATE POLICIES IN RICE SECTOR

To map state intervention model in rice sector, government rice policies and plans in major rice producing countries have been studied as follows. The main purpose of this part was to provide a brief description of the most important policy measures introduced by governments rather than to draw their market implications.

China

Due to prioritization of infrastructure and also owing to past investment in irrigation and flood control projects, China has been, for the most part, self-sufficient in rice for the last two decades and simultaneously, is the biggest rice producer in the world. Despite heavy support by the state in research and services, the main source of increase in China rice production has been yield increase. This has been made possible by means of modern varieties (including hybrid rice) and cultivation technologies, as well as heavy application of chemical fertilizer and pesticides. It was during the 1980s that, the Chinese government started increasing its expenditures on infrastructure, resulting in the expansion of irrigated areas. Money poured into research and development paved the way for the introduction of new seed technologies. Government also provided subsidized inputs and credits to further boost production (Obanil and Dano, 2005). The state also monopolized rice procurement through the procurement contract system, developed price support plans, and determined the rice production volume. A strong research and development sector that developed and bred improved seeds, particularly hybrid rice, working closely with a strong seed industry that has earlier put in place an efficient system of seeds distribution is the key to China's success in this strategy which is largely fueled by heavy government subsidization (Obanil and Dano, 2005).

India

India is the world's second largest producer of rice, accounting for more than 20% of all world rice production. Rice producers in India continued to benefit from high government subsidies on inputs; in particular fertilizers and irrigation, but also from procurement at minimum support prices (Sarris, 2005). Gains in India rice output were driven mainly by the adoption of high-yielding varieties (HYVs), expansion of irrigated areas, increased cropping intensity, and supportive input and output price policies. Indian policymakers have considered a range of policy options to strengthen the performance of the wheat and rice sectors and control budgetary costs. Public

distribution system, as well as the Minimum Support Prices (MSPs) for rice has been aimed at reducing the government stock surplus, better targeting of food subsidies to the poor, and correcting price distortions (Jha et al., 2007). The major input policies affecting India's rice sector are subsidies on fertilizer, power [electricity], and irrigation water, together with state investments in surface, and to a lesser extent, ground water irrigation (Anonymous, Government of India, Ministry of Finance; 2006).

In Addition, the Indian government halted export subsidies because of tightening domestic supplies and reduced Indian competitiveness in international markets, although private traders remain free to export rice. High minimum support prices for the rice resulted in increased production and procurement of this crop. Coupled with subsidies on fertilizers, power [electricity], and irrigation, rice price policies have had a detrimental effect on the production of other crops, as well as on soil and water resources in major producing areas (Obanil and Dano, 2005).

Indonesia

Although yield improvements were largely the result of irrigation expansion and increased use of HYVs and fertilizer application, but rice production growth has been sluggish in Indonesia in recent years. In the mid-1980s, Indonesia achieved self-sufficiency in rice mainly due to the use of HYVs, fertilizers and pesticides, as well as irrigation expansion. However, this was not sustained; in the early 1990s there was a decreasing state investments in irrigation and post-harvest facilities. At the same time, fertilizer subsidies were dramatically reduced and eventually phased out in 1997. Since the pesticide and insecticide subsidies had already been removed as early as 1983, the removal of the fertilizer subsidy adversely affected the majority of Indonesian farmers, 85% of whom are still dependent on HYVs (Obanil and Dano, 2005). Lack of infrastructure support, primarily irrigation facilities also continues to hamper productivity. Regrettably, the Indonesian government's unsustainable export-led industrialization strategy that penalized its agriculture and food crop sector and its continual reliance on international credit that requires it to adhere to controversial policy reforms have grossly undermined the gains achieved by decades of strong government intervention in this sector (Gilpo and Ignacio, 2005).

Vietnam

The rise in output and productivity of Vietnam's rice industry is attributed to the use of HYVs, and irrigation development. Apart from limited direct support through

fertilizer and seed subsidies, the government also provided fertilizer support through a reduction of import tariffs for inputs, particularly Urea and other important fertilizer and pesticides needed by the industry. Government also provides transportation subsidies for traders who are buying rice in the mountainous areas (CBDC, 2001). The major factors, which contributed to the fast growth rate of rice production in Vietnam, included promoting farmers' incentives to increase production. This is owing to the renovation after the American war, as well as the state investment in irrigation or for reclamation of unused resources especially in the Mekong River Delta-land improvement, which expanded planted area. Among those factors also are technological factors including expanded area planted to HYV and improved farmers' knowledge on intensive agriculture (there was heavy investment in extension, integrated pest management (IPM), etc. by the state); increase in supply of input materials under a deregulated system (Kenji and Hironori, 2001).

Thailand

The importance of Thailand as the world's top rice exporter cannot be overstated. The state policy choices that, Thailand makes in governing the rice sector would have real implications for people in all parts of the world, where rice sustains lives as a means of rural livelihood, as food or as both. The case of Thailand is unique in that, unlike most of its Asian neighbors, the Green Revolution was not a major factor in the development of its rice industry. Land utilization was the driving force behind the long-term performance of Thailand's rice sector before the 1980s (Abdullah et al., 2001). Thailand's per capita cropland, for example, increased by 60% between 1965 and 1996 (Hayami, 2001). State expenditure in the rice sector has been relatively robust. Government invested in upgrading the country's road network, giving Thailand one of the most extensive paved road networks among the countries included in this research. There was heavy public spending for irrigation in Thailand's Central Plains where the bulk of the country's HYV crop has been concentrated. The government of Thailand largely taxed rice exports through four measures; rice premium (a fixed fee on rice exports), export duties, quotas and reserve requirements (Obanil and Dano, 2005).

Philippine

Under the framework of continuing state intervention, the Philippine had a range of options for raising rice production to meet domestic requirements. Food securities, food self-sufficiency, increasing farmers' income are goals common to government and civil

society. Government tried to encourage hybrid seeds, funding supports on irrigation projects development, encouraging farmers to raise their fertilizer usage from current levels; adoption of technologies that are more efficient and machineries are suitable for rice farmers as well as expand knowledge intensive technologies; plus providing credits. On the other hand, since milling operations in the country are largely controlled by the private sector, government cannot substantially affect them (Obanil and Dano, 2005).

United States

The agricultural and rice policies of the United States (US) are of great interest to developing countries since changes in US food and agricultural policies usually affect world commodity markets. The rice industry is relatively small compared to other commodity sectors in the United States. Although small in its national context, it has had much impact globally since a big chunk of its production (43% of total production) is sold in the world market. Its world share is about 1.4% of total world rice trade (Alarde-Regalado, 2005). This performance far surpasses that of other countries. Apart from the adoption of sophisticated farming technologies, high yields can be attributed to the use of HYVs, better fertilization, irrigation and pest management. US government is committed to expand economic and trade opportunities for agricultural producers, through commodity and income support, export promotion, farm credit, risk management and related programs, as well as enhance the long term economic viability of American farmers and ranchers by providing them with safety nets (Anonymous, USAD, 2004). In the case of rice, any substantive change in its rice policy would have an impact on world rice markets, as the US is one of the major exporters of rice. US rice has been dumped and continues to be dumped in the international market at prices below production costs, depressing world prices of rice (Childs and Burdett, 2000). The rice sector continues to receive subsidies in the form of direct payments and marketing loans. State support to the rice sector includes (but is not limited to) income support to farmers, price support and marketing loans.

South Korea

Rice is well suited to the South Korean climate, since summers are characterized by high temperature, abundant rainfall and high humidity, which are favorable for rice growing. 84% of South Korean farms produced rice in 1992 and 56% of arable land was devoted to rice production (Anonymous, Ministry of Agriculture, Forestry and Fisheries, 1994 [MAFF]). Providing adequate production incentives for farmers, in order to achieve national self-sufficiency in rice and to raise farm incomes,

holding down consumer price in urban areas; and stabilizing the farm and retail prices of rice, especially in the immediate pre- and post-harvest seasons are the main goals of Korean State in rice sector (Dong Cho, 1996). Government tried to maintain stable economy through the control of grain supply and demand to assure a sufficient amount of grain with stable prices. The grain market of South Korea has been a two dimensional system characterized by both free market and controlled prices, even though the degree of government price control varied with changing grain market conditions. Government rice procurement was also linked with provision of fertilizer and financing to rice farmers. The South Korean government policy of rice self-sufficiency has been carried out primarily with the mechanism of a two price system, which is characterized by a high price paid to rice producers and a low price charged to rice consumers. As a result, the two price system has brought about distortions in resource allocation and large government cost for purchasing and releasing of rice (MAFF, 1994).

Malaysia

Rice is a highly protected crop in a strategically important industry in Malaysia. Thus, being the staple food of the vast majority of the population, Malaysia's self-sufficiency program has consistently focused on rice.. Rice production in Malaysia has continually increased since 1987; even those areas devoted to rice production have decreased constantly. Yield improvements can be traced to government's efforts to modernize the sector through mechanization as well as significant investments for an infrastructure program, which increased the irrigated area devoted to rice in the country (Obanil and Dano, 2005). Despite the state investments directed at improving physical infrastructure, such as roads, drainage and irrigation facilities, the government has provided production cost subsidies such as fertilizers, pesticides and seeds to increase rice production. The government also promoted the adoption of multiple cropping annually. Likewise, the state undertakes active research and development in rice by seeking high-yielding seeds and varieties. The government also provides extension services and established marketing channels for rice producers.

Rice sector in Iran

It is believed that rice (Berenj in Persian) was brought to Iran from the Indian subcontinent in ancient times (Wikipedia, 2010). Like in many Asian countries, rice is a main staple food in Iran particularly in the northern areas where rice is produced in large quantity. Nevertheless, due to rapid growth in population and increasing demand

for more rice to feed people, every year the gap between production and consumption of rice is widening, and both the direct and indirect policies of Iran's state intervention are important to close and narrow this gap. Although the principal obstacles to agricultural production in Iran are primitive farming methods, overworked and under fertilized soil, poor seed, and scarcity of water (Anonymous, World Bank, 1994) among the factors affecting the increasing gap between production and consumption of rice, policies of the government can be highlighted. These policies are including input subsidies, credit programs, guaranteed price, distribution of coupons, and the importing of rice using foreign exchange valued at a special cheap rate allocated for food (Bakhshoodeh and Soltani, 2002).

Nevertheless, due to the aforesaid, Iran state intervenes in the rice market by controlling the imports volumes to support consumers and to prevent the rising of rice prices in the country. In an effort to achieve and maintain national self-sufficiency in basic agriculture commodities, variety of programs, such as price support, input subsidies and etc; were adopted by the post-revolution government in the 1990s. In general, the implemented policies for supporting rice producers in order to achieve a stable price and income has resulted in unsatisfactory outcomes that are mainly counter to the general objective of self-sufficiency in agricultural products (Bakhshoodeh and Soltani, 2002). Higher government subsidies for grain and other staples and expanded short-term credit and tax exemptions for farmers complying with state quotas were intended to promote self-sufficiency. For the past few years, Iran has been trying to become self-sufficient but because of various issues, including this year's drought, the state has not been able to achieve its goal (Mongabay, 2009).

COMMON POLICIES IN THE STATE INTERVENTION PLANS

Although developing countries had large scope for increasing assistance to rice producers, most of them were constrained by a lack of budgetary resources or by the terms of their agreements with other international institutions. Therefore, several of them promoted instruments other than public market intervention to shield the sector from large price variations (Sarris, 2005). These are included subsidized insurance schemes and futures trading, which rather than stabilizing prices, transferred the price risk onto other players. On the other hand, some other developing countries adopted production-cutting measures, while raising compensatory or emergency payments to farmers, but also moved to improve the sector competitiveness by fostering a consolidation of rice farms and productivity gains. A number of countries moved towards more market-based

rice distribution system and, rather than guaranteeing cheap supplies to all consumers, increasingly targeted their public rice distribution to the needy. As the responsibility of the state enterprises in distribution lessened, fewer governments exercised controls over wholesale and retail prices. Governments also widened the scope of their policies to encompass the full rice marketing chain, from production to consumption, in an attempt to improve the efficiency of the distributions systems. In many instances, they also took measures to bolster the role of the private sector in the various phases of the commodity, from production to processing and marketing.

A prominent and conspicuous part of all state behavior and policies in the rice producing countries is government's intention to increase rice production output. This is understandable given that, rice is the main staple food and its production in many Asian countries is primarily intended for domestic consumption. The forms of interventions included employment of modern rice technologies (with heavy dependence on the adoption of improved rice varieties, promotion of inorganic/chemical inputs and extension of infrastructure support, particularly irrigation systems) to policies explicitly aimed at securing a production quota (Obanil and Dano, 2005). For Example, in the United States, where rice is not the primary staple and domestic consumption remains minuscule relative to that of Asian countries, government's intervention is geared primarily towards ensuring the income of its rice producers. In this case, interventions ranged from direct payments for rice producers to liberal provision of crop insurance. Intervention by the state invariably played a critical role in ensuring the continued viability of rice production and guaranteeing farmers in sufficient numbers would continue to plant enough rice to feed the population in rice producing countries. In the case of China, the state even went further as to inhibit the movement of the labor force through the Huoku system which discourages migration from rural to urban areas. Strong state intervention, of course, means additional costs in terms of government resources and involvement. Another common factor is the issue of limited resources and their availability which is quite eminent in economically struggling countries like developing countries, as well as the long-term political repercussions and impact on national food security.

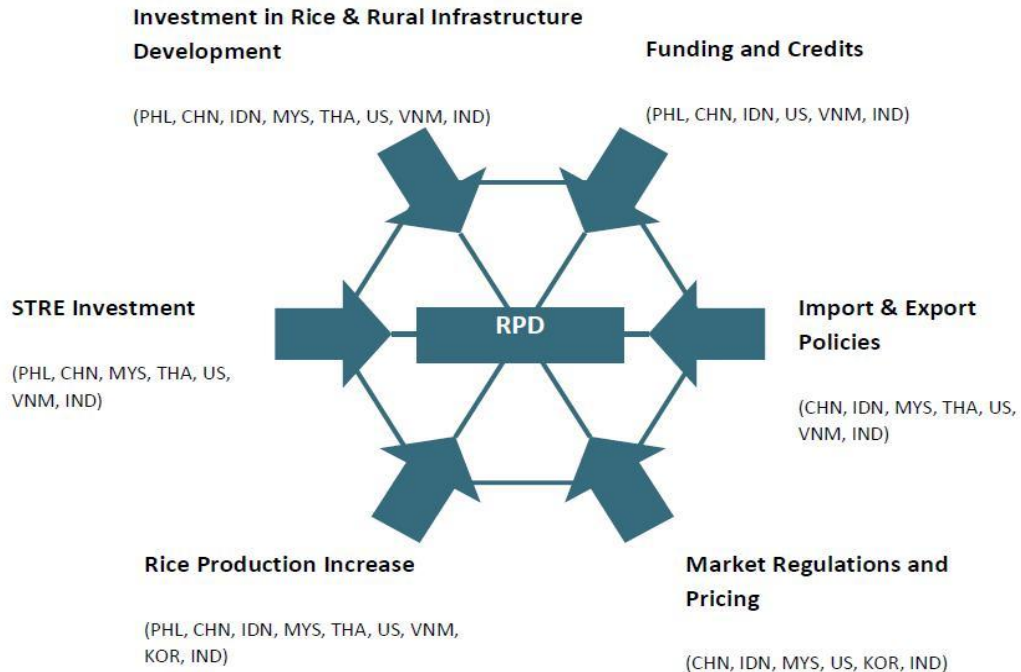
UNIVERSAL STRUCTURE OF THE STATE INTERVENTION

A valid question for many countries in developing world as well as Iran, therefore, would be whether the state can afford to continue supporting rice production, despite the heavy burden it places on limited budgetary and non-budgetary resources. Any decision without having clear

plan and structure for the state interventions will make the situation much more complex. The broad range of experiences by several rice-producing countries in this study clearly point to state intervention as crucial factor for the success of rice producing development. The type of intervention is however, just as important – if not more important. Depending on the type of intervention, the state can either boost efforts to achieve self-sufficiency and promote farmers' welfare or hinder them. Indeed, there is no one single solution to the problems in long-term from the food security point of view.

However, such options should strictly adhere to basic principles that will not sacrifice environmental sustainability, farmer empowerment and democratic participation-elements that should be present if a country intends to seriously pursue long-term food security (Obanil and Dano, 2005). Although an understanding of the structure of government intervention in rice sector is essential to design any kind of structured model for intervention policies, empirical studies, which would determine parameters, are generally lacking. Nevertheless, common factors in state intervention policies, which other top rice producers countries have been carried out can be listed. Previous review of the state intervention in rice sector in this paper has shown the positive impact of these policies on rice production development in respective countries. The model describes the policy environment that have helped to shape the viability of the rice sector and the affordability and reliability of rice supply, specifying the institutional details of the state interventions as well as the strategic policies that drive them. It also, could help to establish parameters for measuring the effectiveness of Iran's state intervention and, using these parameters, draw lessons relevant to the design and implementation of the state policy related to the rice sector for Iran. This structure is drawn from top rice producing countries state in rice sector and its strategic direction of agricultural policy as context. State intervention in rice sector – specifically the fiscal space and government priorities, institutional organization, state trading company and pricing policies are among topics that give inputs for structuring state interventions. This would help to analyse/evaluate the elements of the state intervention for enhanced viability of the rice sector.

This also includes an analysis of how governments balance the potential trade-offs between the goals of protecting smallholder producers and pursuing food security, how the multilateral (international and regional) trade arrangements impaired or enhanced the process of fashioning national food policies and how countries live up to their multilateral trade commitments. Regardless of ultimate country desire, whether it is self-sufficiency or rice growers welfare, based on the major rice producing countries state behavior review, in the list that follows, six specific areas of state intervention are identified, which



Legend:

Philippines: PHL China: CHN Indonesia: IDN Malaysia: MYS Thailand: THA
 United States: USA Vietnam: VNM South Korea: KOR India: IND

Figure 1. Areas of the state intervention in Rice Production Development (RPD) in top rice producing countries.

shape some kind of global model of the state intervention in the rice sector (Figure 1). These areas are:

1. Investment in rural and rice infrastructure development
2. Rice production increase
3. Science, Technology, Research and Extension (STRE) Investment
4. Funding and credits
5. Market regulations and pricing
6. Import and export policies

In each area, there are some certain policies that states make/undertake to assure that the main goal of that strategy is being met. At this level, either government has to go directly with “state agency” to deliver the targeted goals or make business atmosphere interesting for private sector to come and shape the business. Whichever of these two approaches states have taken, the final target has been to promote rice production as a strategic commodity. Policies also varied from country to country. Even though the terminologies might be similar, the real implications and executions, based on the economic structure and states capacities, are different. China and Vietnam have fully-governmental and semi-

governmental economic structures while United States has a market-based economic structure. Table 3 shows common universal policies of the states intervention in rice production development. It summarizes state strategies in rice sector and shows different kind of executive policies that have been implemented. It also shows common policies in specific areas that states normally intervene. These areas are shaping proposed global structure for the state intervention in rice production.

CONCLUSION

Should government intervene in the rice sector or should it leave this sector to deal with its challenges? This is a key question which theoreticians can debate on. There are historical and current examples of the studies to provide efficient theoretical mechanisms of government related policies and interventions. Nevertheless, it is accepted that economic policy regimes in initial stages of economic development should set policies: as such could help countries and economic sections to maintain economic stability and capital formation (human and monetary)

Table 3. Comparison table of the state intervention policies in rice sector in top rice producing countries.

Country (World rice production share %)	Areas of state intervention					
	Rural infrastructure development	Rice production increase	STRE Investment	Funding and credits	Market regulations and pricing	Import and export policies
China (28.8)	<ol style="list-style-type: none"> 1. Expenditure for agricultural infrastructure to expand irrigated areas 2. Rural anti poverty programs 	<ol style="list-style-type: none"> 1. Subsidized inputs 2. Support of modern varieties (including hybrid rice), cultivation technologies, and heavy application of chemical fertilizer and pesticides 	<ol style="list-style-type: none"> 1. State budget for agricultural infrastructure, science and technology studies, and rural relief funds 2. Government support for research and support services 	<ol style="list-style-type: none"> 1. Subsidized credit. 2. Secured flow of funds to rural financial institutions. 	<ol style="list-style-type: none"> 1. Monopolized rice procurement through the procurement contract system. 2. Determined rice production volume. 3. Price support programs. 	<ol style="list-style-type: none"> 1. Procurement and price level control. 2. Foreign trade control policies. 3. Quantitative restrictions and export subsidies policies.
India (21.6)	<ol style="list-style-type: none"> 1. Rural people betterment 2. Irrigation development schemes 	<ol style="list-style-type: none"> 1. Subsidized seeds plans 2. Subsidized fertilizers 3. Subsidized pesticides 	Rural research, education and extensions programs	<ol style="list-style-type: none"> 1. Regional Local Banks 2. Production credits 	<ol style="list-style-type: none"> 1. Public distribution system 2. Minimum support prices 	<ol style="list-style-type: none"> 1. Export restrictions 2. Quantitative control on import and export 3. Export tariff 4. Export subsidies
Indonesia (8.6)	<ol style="list-style-type: none"> 1. Irrigation facilities and rehabilitation of existing ones 2. State support for infrastructure such as roads and ports 	<ol style="list-style-type: none"> 1. Promotion of high yielding varieties and marketing support 2. Fertilizer and pesticide subsidies 	N/A	Government support on credit	Three type rice prices	Rice import tariff
Vietnam (5.7)	Strengthening cooperatives and other rural institutions	<ol style="list-style-type: none"> 1. Equal access to land 2. Subsidies on fertilizer and seeds 	Greater focus on research and development	Subsidies on credit	N/A	<ol style="list-style-type: none"> 1. Import tariffs 2. Export subsidies
Thailand (4.6)	Upgrading the country's road network	The vast area planted to rice	Land utilization	N/A	N/A	Export duties
Philippine (2.4)	<ol style="list-style-type: none"> 1. Funding supports on irrigation projects development 2. Encouraging farmers to raise their fertilizer usage from current levels 	Encourage hybrid seeds	<ol style="list-style-type: none"> 1. Adoption of more efficient technology and machinery suitable for rice farmers 2. Expand knowledge intensive technologies 	Providing credits	N/A	N/A

Table 3. Contd.

United States (1.4)	Broader and more modernized infrastructure	1. Better institutions, facilities, equipment, investments 2. Commodity and income support	Risk management and related programs	Farm credit	Direct payments to farmers	Export promotion
South Korea (1)	N/A	1. Production incentives for farmers 2. Collecting and distribution mechanism	N/A	N/A	Government pricing mechanisms	N/A
Malaysia (0.3)	1. Investments in building drainage and irrigation facilities 2. State investments to improve physical infrastructure such as roads, irrigation & drainage systems	1. Fertilizer subsidy and price support 2. Subsidies for such inputs as fertilizers, pesticides and seeds 3. Mechanization program	1. Undertakes active research and development studies in rice 2. Research and development studies on high yielding seeds and varieties 3. Provision of extension services and marketing	N/A	Guaranteed Minimum Price (GMP) Controlled prices at milling, wholesaling and retailing	Monopoly on imports

(Anonymous, World Bank, 1997). Now, there is an agreement among all the economic theories when it comes to 'government' and its policies in any economic sections, that government could not be ignored. Governments have long intervened in domestic and international markets for agricultural and food products (OECD, 2002). The theory of the state intervention initiated by developing countries makes the point that, the persistence of distortions in the global agricultural markets requires "strategic" interventions on their part. The use of policy instruments by the United States and the European Union to improve their advantages in the global agricultural markets has resulted in an interesting debate in the context of the

reshaping of the global agricultural policies, in which the World Trade Organization (WTO) is currently engaged (Dhar, 2007).

Nevertheless, the role of the state in agriculture in general, and rice production development in developing countries implemented is promoted by the policy makers. The global model of the state policies in rice production development, which proposed in this paper, is aimed to give structure to different and wide spread attempts of government to develop rice production in Iran. This model is assumed that government policies are consistent not just in space but also in time. Since policy makers in developing countries have full control over the policy instruments, therefore,

they should have clear image of what they are going to achieve and how. These kinds of models are assumed to be like a road map to policy makers, to stop misallocating resources and be as efficient as possible. This model also aims to structure and assess the impact of policies that have been developed for rice sector. It is also very important that policy-makers in state agencies can predict the consequences of different control policies before they are actually implemented.

The proposed model can give clear criteria and measures, to assess the impact of the policies that state would undertake in each section. Since areas of the state intervention have already been examined and implemented in some of the studied

countries; therefore, the model should only be tested to identify the inter-relations among the model variables, as well as importance and priority ranking from stakeholder's perspective. Moreover, from a pragmatic viewpoint, an interdisciplinary approach is required to build scenarios, as well as the interpretation of outcomes, which can result from implementation of this model. This can be examined in separate studies.

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