

Evolution of irrigated agriculture and its prospects in Myanmar

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1. Introduction

After the end of economic sanctions by western countries, Myanmar receives wide attention from foreign investors for its growth potentials, abundant resources base and educated population. This paper focuses on the irrigation development after 1988, which prioritize the development of water resources by constructing dams, and its impact on yield or rice production. In particular, the regions are grouped, and characteristics of farming and irrigated agriculture in these regions are analyzed taking account of the effects of climate conditions and historical evolution of irrigated agriculture.

2. Historical evolution of agricultural policy and irrigation development

After the independence until the late 1980s, the military controlled government took socialist approach of adopting centralized planning, distribution and pricing in agriculture and other forms of production. In 1989 the country was renamed Myanmar by a new military government, and the first steps were taken towards promoting a market economy. Irrigation plays a major role in the development of Myanmar's agriculture, and "provision of sufficient irrigation water" is one of the 5 strategies of agriculture development. In government investment budget, irrigation department received high priority and the share of capital investment in the ministry and in the government budget reached as high as to 65.3% and 3.5 % in 1990-91, 82.9% and 13.9% in 1995-96, and 61.5% and 8.7% in 1999-2000, respectively. As a result, water resources development proceeded at a remarkable speed after 1990s as it is shown in Figure 1. Irrigable area in 1961 was 345 thousand ha, which increased gradually to 541 thousand ha in 1988. However, with strong focus of developing irrigation systems, the irrigable area more than tripled to 1,698 thousand ha in 2010. The expansion of irrigable area is mostly utilized for paddy irrigation, which expanded from 858 thousand ha in 1985 to 2,100 thousand ha in 2005. On average about 75% of total irrigated area is for paddy irrigation.

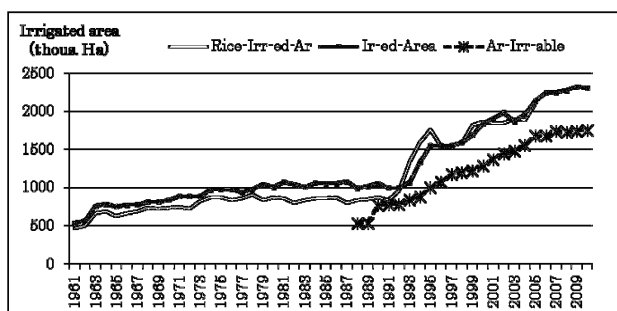


Figure 1 Development of irrigation

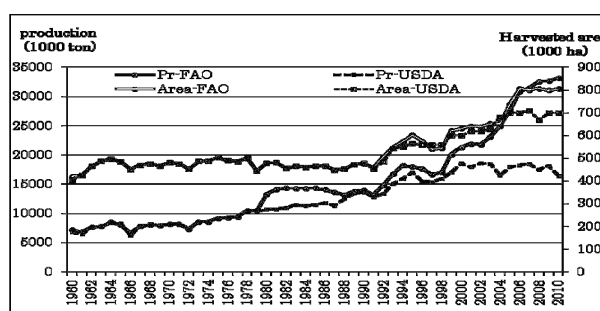


Figure 2 Trend of rice production and harvested area

Source: IRRI WRS, MOAI-Myanmar

3. Rice production and yield

With intensive irrigation development, rice harvested area started to increase significantly after 1991. Figure 2 shows the trend of harvested area and production of rice after 1960 with FAO and USDA data. According to USDA, rice production has been stagnant or even decreased after 2000. Muroya (2012)

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analyzed this situation as saying that the profitability of rice cultivation has deteriorated markedly with significant fertilizer and oil cost increase as well as the cut of government subsidy after 2000. Myanmar had similar yield with Vietnam at the end of 1980s, but Myanmar's yield growth has been slow (with FAO data) or stagnant/declining (USDA data). Fertilizer input for rice farming was about 70 kg/ha in 1985 but it declined to less than 20 kg/ha in 2001, then to less than 1 kg after 2003 (Statistical Yearbook 2006, MOAI). Even with irrigation development and adoption of HYV, increase yield would not be feasible under such condition.

4. Rice production by state and profitability of production

To analyze the impact of irrigation development on rice production, major rice producing regions are selected from upper Myanmar (Mandalay, Magway, and Sagaing) and lower Myanmar (Bago, Ayeyarwady, Yangon). Response to irrigation development differs among divisions as shown in Figure 4. Sagaing increased summer paddy irrigated area comparable to the area of irrigation development, but other states did not increase summer paddy cultivation as much, particularly Bago. Yangon and Mandalay showed only nominal increase in the area of summer paddy irrigation. As discussed earlier, paddy production, particularly using and managing irrigation water became not very profitable, and the response of farmers to the increased potential of using irrigation water became slow and even negative.

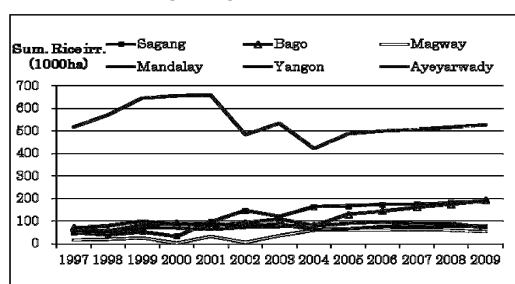


Figure 4 Summer rice cultivation by states

Table 1 Profitability of rice and gram

year	Monsoon rice				Green gram				Black gram			
	Yield kg/ha	Price k/kg	cost* k/ha	Profit k/ha	Yield kg/ha	Price k/kg	cost* k/ha	Profit k/ha	Yield kg/ha	Price k/kg	cost* k/ha	Profit k/ha
2007	3,712	170	399,808	232,717	1,130	538	267,115	341,051	1,291	590	266,127	495,950
2008	3,712	166	478,386	136,321	888	645	357,307	215,364	1,614	492	448,091	345,351
2009	5,156	189	490,246	483,722	1,210	766	306,280	620,701	1,025	725	213,247	530,083

To understand the future prospects of rice production, profitability of cultivating rice and pulse (green and black grams) was compared. Costs include family labor, hired labor, and material costs (MOAI 2011 at a glance). The result is shown in Table 1. The profitability of rice is always below the grams and it is half as much in 2007 or 2008 when the yield was about 3.7 ton/ha. It seems natural that farmers prioritize the production of gram or other cash crops to irrigating paddy under such situation. The production of gram/pulses increased significantly, tripling the acreage between 1990 and 2001 and the export grew to about one million ton in 2002/03.

5. Conclusion

Irrigation development in Myanmar increased the availability of water and potential irrigable areas, however, the development and improvement of on-farm facilities and water management system are lagging behind. In addition, the price of rice does not seem to provide enough incentive to increase the input level and hence results in lower yield and cultivation of irrigated rice area. To maximize the benefits of irrigation development in Myanmar, development and improvement of on-farm facilities and provision of certain price level which can ensure profit and appropriate level of inputs would be inevitable.