

Research Article

DEVELOPMENT OF FISH PRODUCTION IN RICE FIELDS OF NORTHERN IRAN

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ABSTRACT

This study was carried out to investigate the development rate of fish production in rice fields of northern Iran in 2009 and 2011. In this study, adopters of integrated of rice-fish farming were initially identified. Result reported that 397 adopters of rice-fish farming were in *Guilan* province in 2009. These numbers in 2011 were 493 adopters. In this region, sum area of all fields in 2011 was 556 ha while in 2009 was 383 ha. Total production of fish in rice fields was 493 tons in 2011. Generally, number and area of rice-fish fields increased over time in *Guilan* province, north of Iran during 2009 to 2011.

Key Words: *Production, Development, Rice-fish Fields, Guilan in Iran*

INTRODUCTION

The earliest records of fish culture in rice-fields originate from China, circa 2000 years ago, followed by India, 1500 years ago. Other countries with a recorded history of rice-fish culture are Indonesia, Malaysia, Thailand, Japan, Madagascar, Italy, Russia, Vietnam, Egypt, Philippines, Bangladesh, Cambodia, Korea, Iran and other countries. Integrated rice-fish farming offers a solution to economic problem of farmers by contributing to food, income and nutrition (Rothuis, 1998; Saikia and Das, 2008; Frei and Becker, 2005; Halwart, 1998; Karami *et al.*, 2006; Noorhosseini and Allahyari, 2012; Noorhosseini and Bagherzadeh, 2012). Rice and fish are fundamental components of farming systems and diets in many nations. This type of integrated production can optimize resource use through the complementary utilization of land and irrigation water (Frei and Becker, 2005; Saikia and Das, 2008 and Ofori *et al.*, 2005; Noorhosseini and Allahyari, 2011). Unfortunately, despite more promotional efforts of experts in Iran fishery organization, the adoption of integrated rice-fish farming hasn't found its real place among local farmers. Addition, problems of fish farming in rice fields were about economic, fish food, losses of fish, fish fingerlings, water, wildlife, knowledge and expertise, insurance, oxygen, Azolla, transportation and market (Noorhosseini and Allahyari, 2011; Noorhosseini, 2013). This study was aimed to investigate the development rate of fish production in rice fields of northern Iran.

MATERIALS AND METHODS

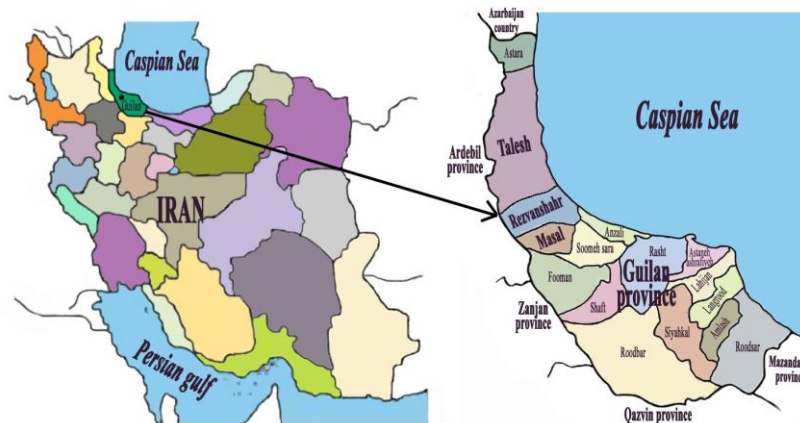


Fig. 1: Site of study

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This study was carried out in 2009 and 2011. Studied area including *Astaneh Ashrafieh, Rasht, Some'esara, Lahidjan, Talesh, Masal, Fooman, Siyahkal, Rezvanshahr, Roodsar, Astara, Bandar Anzali, Shaft, Langrood, Roodbar* and *Amlash* set in Guilan province near to Caspian Sea, north of Iran (Figure 1). In this study, first adopters of integrated of rice-fish farming were identified. Then from mean, sum and chart were used for statistical analysis. Data analysis and was conducted with statistical package for social sciences (SPSS₁₈).

RESULTS AND DISCUSSION

Table 1: number and area of rice-fish fields in north of Iran

| Rank | Name of county | In 2009 | | In 2011 | | Total production of fish (tons) |
|------|-------------------|----------------------------|------------------|----------------------------|------------------|---------------------------------|
| | | Number of rice-fish fields | Fields area (ha) | Number of rice-fish fields | Fields area (ha) | |
| 1 | Astaneh Ashrafieh | 84 | 83.8 | 125 | 123.1 | 123 |
| 2 | Rasht | 48 | 42.2 | 28 | 26.8 | 18 |
| 3 | Some'esara | 44 | 38.9 | 65 | 53.5 | 36 |
| 4 | Lahidjan | 42 | 30.7 | 78 | 75.0 | 93 |
| 5 | Talesh | 31 | 46.8 | 47 | 47.0 | 28 |
| 6 | Masal | 31 | 37.4 | 26 | 13.6 | 10 |
| 7 | Fooman | 21 | 20.5 | 28 | 22.7 | 23 |
| 8 | Siyahkal | 17 | 9.2 | 21 | 14.1 | 21 |
| 9 | Rezvanshahr | 17 | 7.7 | 9 | 6.4 | 4.7 |
| 10 | Roodsar | 14 | 8.1 | 61 | 44.8 | 31 |
| 11 | Astara | 12 | 24.6 | 12 | 26.2 | 17 |
| 12 | Bandar Anzali | 11 | 11.2 | 14 | 22.8 | 24 |
| 13 | Shaft | 11 | 6.2 | 20 | 16.4 | 17 |
| 14 | Langrood | 10 | 11.7 | 55 | 55.1 | 41 |
| 15 | Roodbar | 2 | 2.5 | 1 | 0.3 | 0.3 |
| 16 | Amlash | 2 | 1.5 | 11 | 8.2 | 6 |
| | Sum | 397 | 383 | 601 | 556 | 493 |

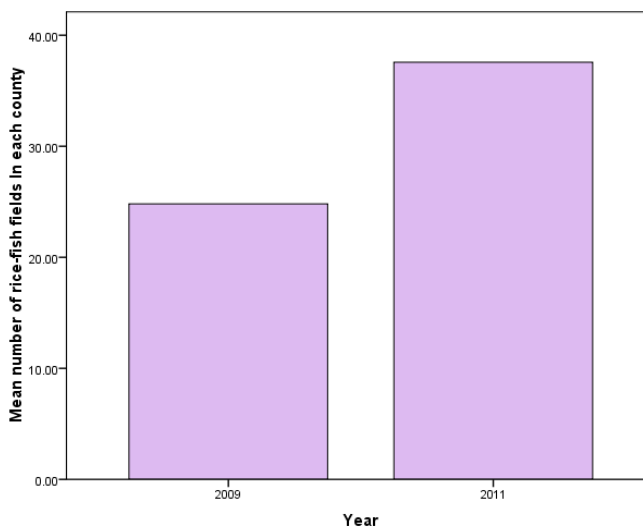


Fig. 2: Mean number of rice-fish fields in each county

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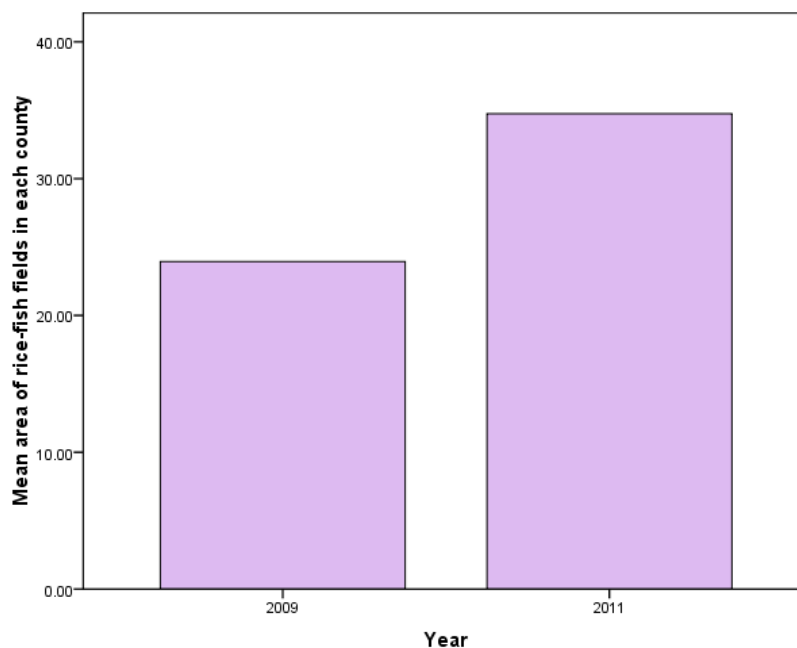


Fig. 3: Mean area of rice-fish fields in each county

Result this study reported that 397 adopters of rice-fish farming were in *Guilan* province in 2009. These numbers in 2011 were 493 adopters. Maximum number of rice-fish fields in 2009 and 2011 were in *Astaneh Ashrafiyeh* County with 84 and 125 rice-fish fields, respectively. Minimum number of rice-fish fields in 2009 and 2011 were in *Amlash* and *Roodbar* counties with 2 and 1 rice-fish fields, respectively. In these regions, sum area of all fields in 2011 was 556 ha while in 2009 was 383 ha. In these regions, total production of fish in rice fields was 493 tons in 2011 (Table 1). Generally, number and area of rice-fish fields increased over time in *Guilan* province, north of Iran during 2009 to 2011 (Figure 1 and 2).

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