

Analysis the Physical Impact of Implementation of a Rural Master Plan in Iran

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Abstract Despite the increase in urbanization and decline in population in rural areas, many rural settlements are still dynamic and comprise a sizable portion of the population of developing countries such as Iran. The functionality of rural areas in maintaining population and rural occupations depends upon the production of an infrastructure to provide services. This requires an organized planning and development process. One tool to provide suitable conditions in rural areas is a rural master plan that provides spatial-physical organization. This case study determined the impact of the physical implementation of a rural master plan in the greater Amol region in northern Iran. The methodology was descriptive and analytical. The data was based on field studies and a questionnaire filled out by respondents from sample villages. The target research population were the rural residents from the region surrounding the city of Amol. The number participants responding to the questionnaires was determined using the Cochran formula ($n = 260$) and its reliability was determined by calculating Cronbach's alpha coefficient (0.92) after conducting a pilot study. The results showed that a the rural master plan was successful in widening the main streets of the village and improving infrastructure services in the area, but was not successful in the participation of the villagers in the rural master plan.

Keywords: rural master plan, development, rural areas, Iran

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1. Introduction

In the past, village life and villagers' needs were basic and sufficient; today living conditions in rural areas have changed and rural residents have new needs. To improve the quality of life in rural areas, researchers have proposed rural master plans [2]. Such rural master plans have been implemented in a major program for rural development in Iran.

Rural master plans have been implemented for many areas. A case in point is a master plan implemented for 9912 villages in Iran from 2000 to 2011 [9]. Its main goals were to improve village life and persuade residents to stay in rural areas, preventing their migration to urban areas [7]. Other goals of the implementation rural master plans are:

- Construct and improve streets and intersections
- Construct and improve sidewalks
- Develop green space
- Construct and modify water supply within the village
- Prepare land for rural development projects
- Construct bridges needed in a village
- Construct a sewage disposal network [4]

A master plan was developed for 24899 Iranian villages and had been implemented in 9912 by 2011 [9]. The present study examines whether or not the rural master

plan has achieved its objectives from the viewpoint of the rural resident.

1.1. Master Plan

Some of the various definitions of a rural master plan are:

- Comprises changes in rural areas on physical, social and economic dimensions.
- Organizes the physical aspects of rural life and defines land use for agriculture, residential, commercial, and public use.

If the above definitions are realized, a master plan can be the most important executive strategy developed for rural areas in Iran. This strategy shows the importance of rural areas and their population capacity for the future [12]. It also specifies the facilities and services needed for this development [17].

In different parts of the world, the rural master plan has been called a local plan, structure plan, comprehensive plan, design strategy, or development plan. The variation of the four main definitions are:

- Master plan: diagram or schema that shows how to develop a site or region.
- Local plan: proposes regional development by allocation of special users with exact boundaries; a written report is provided for each user.

- Structure plan: develops land use policies by a written report and diagram without a plat.
- Comprehensive area plan: provides for long-term development with specific program details [8].

2. Conceptual Framework

A master plan has economic, social, environmental, and cultural impacts on villages, but the physical impact is the most important. Previous studies of Iran show that comprehensive assessments have not been made for the effect of a rural master plan on the target population.

East Asian countries and members of ESCAP (The United Nations Economic and Social Commission for Asia and the Pacific) implemented planning designs in rural centers. These designs were comprehensive plans to be conducted on a broad level. One design was implemented in South Korea in 1970 to create more picturesque villages. The main theme of the plan was participation of the people. The project improved rural roads, the quality of rural housing, drainage, and the drinking water supply and increased agricultural production [16].

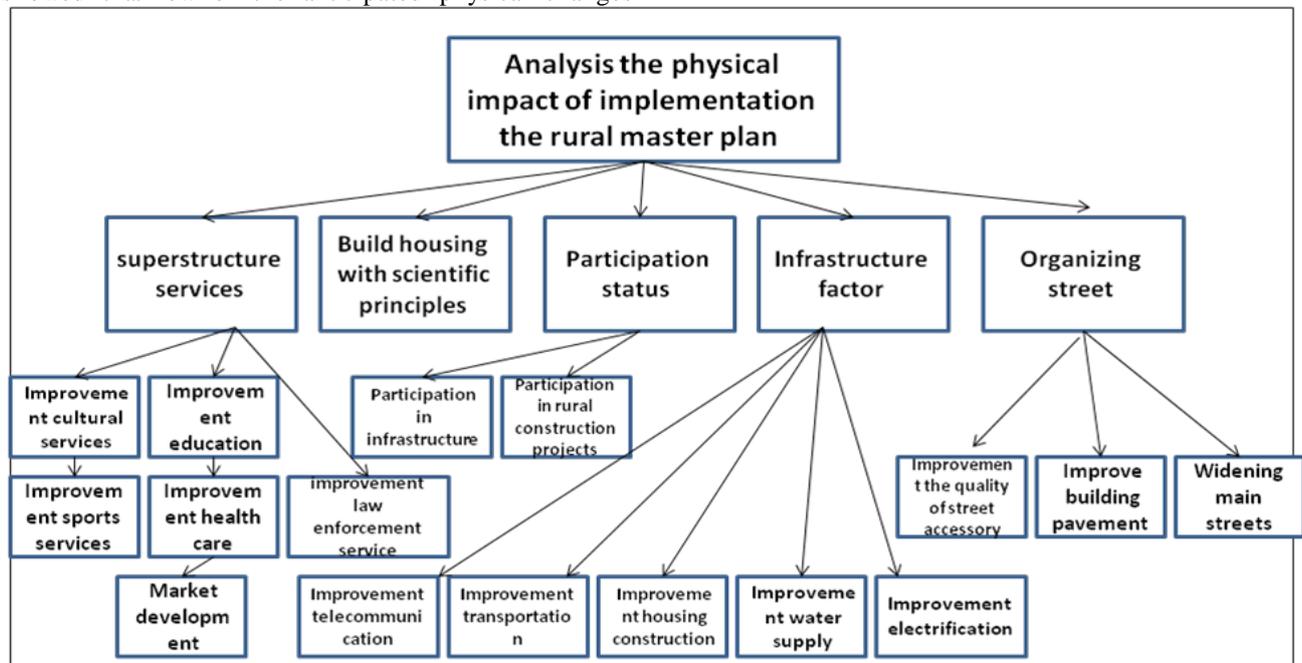
Ian Whyte [18] studied a plan for rural settlements in Scotland and showed that when theoretical approaches and practical techniques are discussed in advance, it will improve rural settlements. Gholamrezaie [9] found that a rural master plan was designed and implemented without considering needs of the villagers and the active participation of the rural residents. Robinson [15] researched a study in East Cape Town, South Africa and showed that few of the anticipated physical changes

actually occurred, which prompted an increase in migration from rural areas to the surrounding cities.

Asgari showed that the rural master plan in Iran improved the relative welfare of the villagers, but has not been successful in organizing villages [5]. Azimi and Jamshidian [6] examined the impact of implementation of the rural master plan in Iran. They showed that the implementation plan improved the lives of people and increased their desire to remain in the villages, but did not succeed in advancing environmental issues or villager participation. There are also several problems in the preparation process of the plan. Papoliand Yazdi [14] showed that high costs, lack of villager satisfaction and participation, lack of attention to rural values and the absence of infrastructure rural planning were the most important drawbacks to the rural master plan in Iran. Amar and Samimi [3] showed that the implementation plan was successful in model housing construction, retrofitting village architecture, sanitary waste disposal, and villager access to services. Moradi et al [13] showed that the rural master plan encouraged reverse migration of villages residents back to the rural areas of Iran.

Afrakhteh et al [1] came to the conclusion that public awareness and knowledge of the master plan was poor, resulting in weak public participation during preparation of the master plan, its implementation and its evaluation afterward.

According to previous research and the impacts defined in rural master plan, framework of research is presented below:



3. Materials and Methods

This research was carried out by the survey method. The statistical population was the rural residents of the villages of the greater Amol region, where the master plan had been implemented. The greater Amol region encompasses 3074.4 km² and is situated in the geographic center of Mazandaran province in northern Iran [11]. A multistage sampling technique was applied and 260

people were selected randomly using the Cochran formula. Data were collected from structured interviews and field observations were conducted of a pilot test to examine the reliability of the questionnaire.

Cronbach's alpha coefficient was calculated from a Likert-type scale and the reliability of the questionnaire was determined using the Chronbach alpha test. The range for alpha was 0 to 1 and the internal reliability of the items was found using this coefficient. When the coefficient was zero, it indicated complete unreliability of the item; when

the value was 1, it indicated full reliability of the item. When the alpha value was more than 0.7, the questions or item was deemed suitable for testing the concept or the related variable. Table 1 shows that the alpha values for questions and items in the questionnaire were higher than 0.7, making it scientifically valid to describe and test the relationship of the variables.

Table 1. Reliability analysis (Alpha)

Scale Name	No. of items in the scale	Alpha value
Physical factor	17	0.831
superstructure services	6	0.791
Infrastructure factor	5	0.805



Figure 1. geographical location Mazandaran province and Amol County

4. Results

The results of this research showed that the viewpoint of rural residents are favorable toward widening main streets, building structurally sound housing, and infrastructure services after plan implementation.

Variables that the rural residents viewed unfavorably were improving street access, superstructure services, improving street pavement, participation in rural construction projects, participation in infrastructure improvement and rural services (Table 2 and Table 3).

Table 2. The physical impact (before plan implementation) of viewpoint of rural residents

Name variable	Mean	Mode
Widening main streets	1.20	Very bad
Improvement the quality of street accessory	.76	Very bad
building structurally sound housing	1.36	Very bad
improving electrical access*	2.21	Bad
Improvement water supply*	1.82	Bad
Improvement housing construction*	1.58	Bad
Improvement transportation*	1.63	Bad
Improvement telecommunication*	2.15	Bad
Improvement health care**	2.01	Bad
Improvement cultural services**	1.20	Very bad
Improvement sports services**	1.40	Bad
improvement law enforcement service**	0.67	Very bad
Improvement education**	1.77	Bad
Market development**	1.77	Bad
improving street pavement	1.67	Bad
Participation in rural construction projects	1.78	Bad
participation in infrastructure improvement and rural services	1.90	Bad

* Infrastructure factor **superstructure services

Table 3. The physical impact (after plan implementation) of viewpoint of rural residents

Name variable	Mean	Mode
Widening main streets	3.66	Good
Improvement the quality of street accessory building structurally sound housing	1.32	Very bad
improving electrical access *	3.75	Good
Improvement water supply*	3.41	Unchanged
Improvement housing construction*	3.26	Good
Improvement transportation*	3.89	Good
Improvement telecommunication*	3.55	Good
Improvement health care**	3.32	Unchanged
Improvement cultural services**	2.84	Unchanged
Improvement sports services**	1.81	Bad
improvement law enforcement service**	1.90	Bad
Improvement education**	0.94	Very bad
Market development**	2.52	Unchanged
improving street pavement	2.58	Unchanged
Participation in rural construction projects	1.98	Bad
participation in infrastructure improvement and rural services	2.42	Unchanged
	2.43	Unchanged

* Infrastructure factor **superstructure services

A Wilcoxon test was used to test the hypothesis. The results showed it to be statistically significant for widening main streets and improving electrical access,

water supply, transportation, health care, sporting services, street pavement, education, and market development (Table 4).

Table 4. Wilcoxon test result of the before and after of the rural master plan implementation

Variables	Ranks	Z	Sig	
Widening main streets	Negative ranks	1	-14.094	0.000
	Positive ranks	257		
	Ties	2		
Improvement electrification	Negative ranks	0	-13.101	0.000
	Positive ranks	214		
	Ties	46		
Improvement water supply	Negative ranks	0	-13.360	0.000
	Positive ranks	226		
	Ties	34		
Improvement transportation	Negative ranks	0	-13.887	0.000
	Positive ranks	247		
	Ties	13		
Improvement health care	Negative ranks	0	-12.372	0.000
	Positive ranks	178		
	Ties	82		
Improvement sports services	Negative ranks	4	-10.800	0.000
	Positive ranks	138		
	Ties	118		
Improvement of building pavement	Negative ranks	1	-12.351	0.000
	Positive ranks	192		
	Ties	67		
Improvement education	Negative ranks	2	-11.484	0.000
	Positive ranks	158		
	Ties	100		
Market development	Negative ranks	1	-12.117	0.000
	Positive ranks	176		
	Ties	83		

The dependent variables examined were the satisfaction of rural residents toward implementation of rural master plan. Regression analysis was performed using the stepwise method and the variables influencing community satisfaction were identified. The results showed that the following variables had greatest impact on resident

satisfaction: improved cultural services, improved health care, market development, participation in rural construction projects, improving street access, improved street pavement, improved water supply, and widening the main streets. The sum of these variables equaled about 58.4% of the changes in the dependent variable (Table 5).

Table 5. Regression analysis

Variables	B	Beta	T	Sig
constant	.317	-	1.720	.087
Improvement cultural services(x1)	.125	.261	5.346	.000
Improvement health care(x2)	.136	.204	4.544	.000
Market development(x3)	.121	.206	4.859	.000
Participation in rural construction projects(x4)	.149	.265	6.437	.000
Improvement the quality of street accessory(x5)	.085	.154	3.318	.001
Improvement of building pavement(x6)	.087	.175	3.716	.000
Improvement water supply(x7)	.102	.142	3.324	.001
Widening main streets(x8)	.086	.129	2.821	.005
R2=0.584	R=0.764	F=44.041	Sig=0.000	

According to Table 4, the regression equation can be written as follows:

$$Y = 0.317 + 0.125 X_1 + 0.136 X_2 + 0.121 X_3 + 0.149 X_4 + 0.085 X_5 + 0.087 X_6 + 0.102 X_7 + 0.089 X_8$$

5. Discussion and Conclusion

The rural master plan in Iran is a comprehensive plan for the development of rural areas. This study determined the impact of physical implementation of the rural master plan in the greater Amol region in Iran. The results showed that the rural master plan successfully achieved villager satisfaction for: widening main streets and improving electrical access, water supply, transportation, health care, sporting services, street pavement, education, and market development. The results agree with those of Jamshidian [6], Amar and Samimi [3], and Anabestani [4]. The unsuccessful areas were: participation of rural residents, improved street access and improved street pavement, which also agree with Jamshidian [6], Latifi [10] and Afrakhteh et al. [1]. Regression results showed that improved cultural services, healthcare and commerce increased villager satisfaction.

The full implementation proposed for land use, such as business development, health services and cultural services, can have a significant impact on villager satisfaction. Increased funding is recommended for full implementation of the plan because the small budgets allocated for the rural master plan has caused some projects to not be fully implemented and may not achieve the desired goals. This study shows that participation in rural construction projects is low. The following recommendations are proposed: informing the residents fully about the master plan goals through training courses, publications and creation of conditions that allow participation of the villagers in the preparation and implementation of the rural master plan.

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