

# Research Paper: The Role of Collaborative Projects in Rural Women's Empowerment and Conservation of Environment: Case Study of Hossein Abad Plain in Sarbishe



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## ABSTRACT

**Purpose:** Today, the emission of greenhouse gasses and global warming are two major global environmental threats. This research attempts to investigate the mediating role of carbon sequestration collaborative project in empowering women and thereby protecting the environment.

**Methods:** This is a descriptive-analytic study using a questionnaire as an instrument for data collection. A comparison was made between the empowerment of women in the target villages where carbon sequestration collaborative project was implemented and control villages with no development plan. The population consisted of women living in villages with more than 20 families in Sarbishe city. A sample of 319 people from the target villages and 354 people from control villages were selected using the Cochran formula.

**Results:** The data analysis in the two samples was done by using t-test, Mann-Whitney Wilcoxon test and unequal variance. Based on results, the Carbon Sequestration Project in women's economic empowerment is effective in protecting the environment and in all indicators except for the index.

**Conclusion:** From the social aspect, according to the output of t-test, the differences in social indicators were significant between the two groups of women. In total, the carbon sequestration project in the study area had led to the empowerment of rural women, prevention of land degradation and environmental protection. In addition, it increased their morale to participate in local decision-making and strengthened their self-esteem, but it was not effective in the development of small businesses especially processing industries. It is necessary to provide sufficient financing and training in this area.

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## 1. Introduction

**T**oday greenhouse gas emissions and global warming are among global environmental hazards. Unfortunately, the results of the efforts to reduce emissions have never been efficient due to the conflict with the economic interests of the superpowers and the capitalists (Falsoleiman & Chakoshi, 2011: 102). However, the consequences of the increase of greenhouse gases have been under international attention. In 1992, all countries of the world signed Convention on Climate Change with the goal of reducing concentrations of greenhouse gases. It was followed by the Kyoto Protocol in 1997 formally ratified by 55 countries with the aim of limiting emissions of these gases.

Today, it is quite obvious that one of the most important methods of reducing greenhouse gas emissions is the sequestration of them in soil or plant organs (Bahrami et al., 2013: 10). In fact, increasing carbon sequestration is equivalent to an increase in plant biomass, increase of productivity, improvement of land fertility, protection of soil and water and prevention of erosion and land degradation (Abdi & Gaykani, 2015: 101). If the overall goal of sustainable development is to create economic resources to improve economic livelihoods through the provision of new employment facilities, optimal utilization of local resources, equal distribution of income with the goal of improving the lives of the poor and providing access to social and economic services (Moghadam, 1993: 34), certainly, this is not possible without the participation of local communities and their empowerment to use in planning and practice (Femi, 2000: 21). Therefore, everyone must be involved in all stages of development because this type of participation is a social, integrated, comprehensive, dynamic, coherent and multidimensional process (Shaditalab, 1993: 19). In other words, development must meet the current needs of society as well as its future needs so that people can have access to resources they need. Development should not destroy the environment which is not possible without the active, conscious and informed participation of local communities.

Probing into many theories of participatory rural development in developing countries indicates an emphasis on reducing the level of poverty and the participation of the poor and the impoverished in development programs (Edvard, 1990: 41). Other researchers such as Alghamni, Gandhi, Neyere, and Obaidullah Khan have emphasized the elimination of poverty and increase of life quality of poor masses in their development theories (PapoliYazdi

& Amir Ebrahimi, 2006: 48). On the other hand, according to gender analysis, which is based on attention to women's roles and responsibilities in development planning, it can improve the efficiency of plans since it is the basis of a new attitude that provides self-sufficiency and self-esteem together with the promotion of development (Henshel, 2008: 87). According to this approach, studies show that women are more oriented than men toward nature and environmental protection, but because they have fewer social and political activities (Mestaj & Riley, 1993), their role is more often ignored.

## 2. Literature Review

The first phase of the project started in April 2003 in Hossain Abad Plain in Sarbishe in order to model carbon sequestration in arid regions with the goal of decreasing poverty by adopting a participatory approach to engage local communities in the conservation and restoration of natural resources on behalf of the United Nations and the Global Environmental Facility (Khorashadi Zadeh et al., 2007: 3). The second phase also happened in this area in 2010 and lasted for 5 years.

The main goal of the project was to prevent degradation of rangelands and desertification that becomes possible via encouraging people to settle in the region by increasing purchasing power and improving the welfare and thus accepting proposals and participation in programs (South Khorasan carbon sequestration project office, 2007: 3). The most important measures taken in this regard include the formation of groups of rural development, improvement of social status, employment, culture, marketing and production of seed and plant (Falsoleiman & Haji pour, 2012: 13). The goal of this study is to identify the effect of this project on the empowerment of rural women and the environmental protection of the region.

Regarding the background of the topic, a few studies have been done over the recent years including Rezaei Givshad (2007) master thesis entitled "the role of micro-credit in empowerment", using qualitative methods to assess the effects of carbon sequestration project on empowerment of women and the role of micro-funds. The results confirmed its economic effects. Abbas Nejad's (2012) studies for assessing carbon sequestration project impact assessment have shown that financial support for projects is effective in improving the economic status of target groups. A study entitled "the role of Carbon Sequestration Project activities in the fight against desertification and people participation in improving the economic and social participation of people in rural

communities" found that holding training classes and the formation of micro-credit funds have a huge impact on people's economic situation. [Saberifar et al. \(2012\)](#), in their article entitled "Sustainable Local Development and attraction of maximum participation of people based on carbon sequestration international experience", stated that when priorities and wishes of local people are taken into consideration, maximum participation of the people is possible and can be increased to over 80%. [Falsoleiman and Heji poor \(2012\)](#) in a study entitled "Analysis of NGO sustainability in rural areas, the experiences of international carbon sequestration project in South Khorasan Province" came to the conclusion that the establishment of rural development groups leads to the strengthening of the spirit of partnership, using educational courses, increase of knowledge and potentials, job diversification, decrease in dependence on pasture and getting to know administrative and banking mechanism. In addition, [Falsoleiman and Haji pour \(2011\)](#) assessed "the role of the Empowerment of Rural Women Project" and found that the level of women's awareness, income increase, diversity of business activities, financial independence, more participation in decision makings and change in the attitude of women increased as the project proceeded. [Farzana \(2011\)](#) in a research in Bangladesh argued that providing environmental information to women is a mechanism to protect the environment.

[Maleki and Alipoor \(2014\)](#) in an article entitled "Analysis of Factors Affecting Environmentalism in Iranian Women" came to the conclusion that the variables of social partnership, religion, environmental awareness, age and education were significantly associated with environmentalism in women, but the economic class had no effect on their environmentalism. In contrast, [Engelman \(2016\)](#) shows that there is a positive relationship between women's empowerment and environmental sustainability, but there is no gender difference in protecting the environment. [Nemat Elahi et al. \(2017\)](#) in a research entitled "Study of the ability of rural women participating in micro-credit funds of South Khorasan carbon sequestration project" found that 58.5% of rural women participating in micro-funds had medium ability and 34% had high ability, which has increased the income of rural households and naturally reduced their dependence on rangeland. Through a study conducted in 2017, entitled "Women's Empowerment and livelihood change in the villages covered by the carbon sequestration project in the Ben Roud section of Isfahan province" Mohammadi reached the following conclusions: participating in this project has increased the level of awareness of the villagers and their willingness to start

small household businesses in order to change the source of income, employment of 119 people and participation of residents in combating desertification and controlling wind erosion in 168 hectares of the region. [Mohammadi et al. \(2018\)](#), in a study entitled "Study of activities and achievements of rural women in the first phase of the international project of generalization of carbon sequestration in Markazi province from the beginning to the present" found that participation in social activities by rural women who have had technical and vocational training, created jobs and home businesses, has improved and it has enhanced their capabilities, increased their independence, generated income, met their economic needs and reduced their worries about the future.

[Bamarinejad et al. \(2020\)](#), in a study entitled "Study of carbon sequestration project from the perspective of change in human development indicators (case study of Hossein Abad Ghinab plain in Sarbisheh, South Khorasan)", concluded that the region's human development index has increased from 0.426 in 2005 to 0.521 in 2012. [Tyagi and Das \(2020\)](#) in their research, studied Baiga women who rose up to claim their rights for forest resources and tried to take control of local forest resources.

[Po and Hickey \(2020\)](#) in their study entitled "Cross-sectional relationships between social capital and women's participation in farm decision-making, a multilevel study in Kenya's semi-arid regions" concluded that women use the social bridge to increase the diversity of information and educational resources. Progress in regional development, strengthening financial resources and using social capital are effective in empowering women in smallholder land systems. [Balezentis et al. \(2021\)](#) in his study, looked at the differences between the education levels of men and women and concluded that if women were more literate and knowledgeable in Lithuanian agriculture, they would have a positive impact on agricultural innovation. Women's participation in agriculture and an increase in their environmental awareness expands the inclination to innovation and economic resilience.

### 3. Methodology

The research method is descriptive-analytical. The role of the carbon sequestration project in empowering women and protecting the environment in the villages where the project is implemented is comparatively analyzed. The required information and documents were obtained by library and field research using a self-administered questionnaire. The data reliability has been confirmed

by Cronbach's alpha coefficient (0.86). The population consisted of rural women living in 123 villages of more than 20 households in Sarbishe. The research was carried out in 40 villages of the Hossein Abad area. To evaluate the project, 60 villages were randomly selected as the sample (20 villages and 40 villages with and without a plan). According to 2007 statistics, from the total of 6309 women heads of households of the sample villages, 319 were chosen as the target and 354 served as the control group, and they were interviewed. Since the main aim of the project was to prevent rangeland degradation and desertification, a few measures were taken to improve the economic and social situation and encourage people to settle in these areas. To assess the project impact, indicators shown in Table 1 were determined. To analyze the data, the t-test, Wilcoxon test and Mann-Whitney test were used with unequal variance.

The study area includes the catchment area of 144,000 hectares in Hossain Abad plain, Ghinab under the jurisdiction of Sarbishe in South Khorasan province. Basin average altitude is 1700 meters. This plain is exposed to high erosion caused by 120-day Sistan winds and the prolonged effects of drought in the region with severe negative economic and social impact on the lives of the residents of this area. It has increased rural migration. The population of the study area before implementing carbon sequestration and up to 2007 was constantly falling, but then with the appearance of the results of the project, the population of the village of Hossain Abad plain increased, and from 1866 in 2007, it reached 5695 in 2012 (South Khorasan carbon sequestration project office, 2008, P: 12). Figure 1 shows the position of the Hossein Abad plain of Sarbishe.

Table 1. Aspect and Index

Aspect	Index	Abbreviation
Economic	Ability to save	A.S
	The ability to receive and pay loans	A.R.PL
	Access to agricultural credit and agricultural land	A.AC
	The ability to invest in building processing plants	A.I.BP
Social	Determining the level of enjoyment of natural resources	D.LE
	Awareness of the need to protect natural resources, particularly pastures	A.N.R
	Having confidence in indigenous and environmental knowledge	H.I.K
	Having talent in the productivity of land and self-employment	T.SE

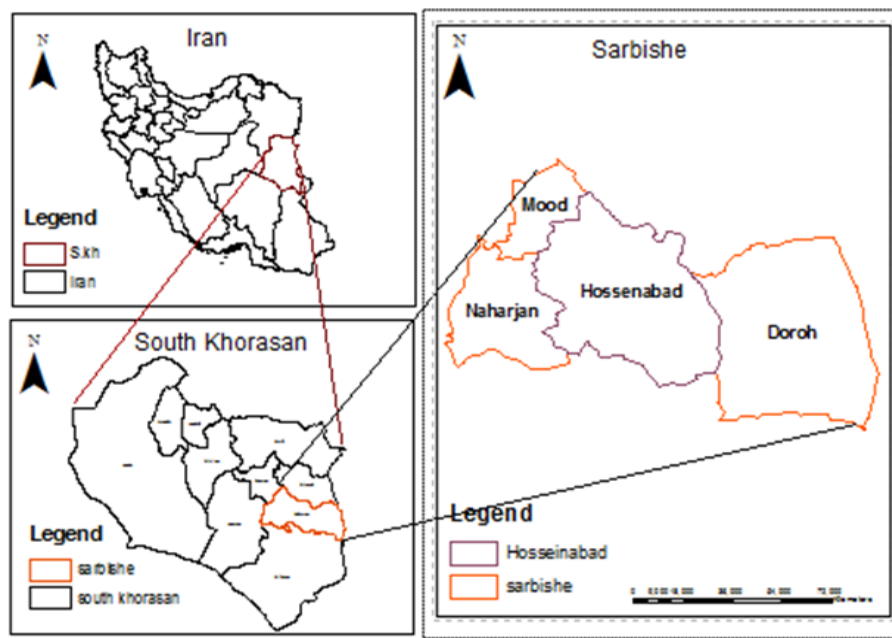


Figure 1. position of the Hossein Abad plain. Source: Research Findings, 2019



## 4. Findings

### Economic aspect

To identify the effects of the project on the status of women's economic empowerment, indicators including "potential savings", "ability to receive and pay the loan", "ability to invest in processing plants", and "access to agricultural credit and agricultural land" were used. The findings show the project's impact on women's empowerment from an economic perspective and environmental protection. As Table 2 and Figure 2 show, there is

a significant difference between the target and control group regarding the Mann-Whitney and Wilcoxon test and the mean rank of the indicators in all cases except for "women's ability to invest in processing plants".

In addition, as Table 3 shows, the t-test, assuming unequal variance, also shows that the difference between the two groups was significant in the first three indicators. Women using this project had a higher level of empowerment compared to rural women in the control group.

Table 2. Mann-Whitney and Wilcoxon test and mean rank of the indicators

Index	Sample	Mann-Whitney	Wilcoxon	Z	Sig
	A.S	48143.500	110978.500	3.491-	000/0
	A.R.PL	27981.500	90816.500	11.887-	000/0
	A.AC	25214.500	88049.500	12.822-	000/0
	A.I.BP	48351.500	99391.500	3.463-	001/0

Source: Research Findings, 2019

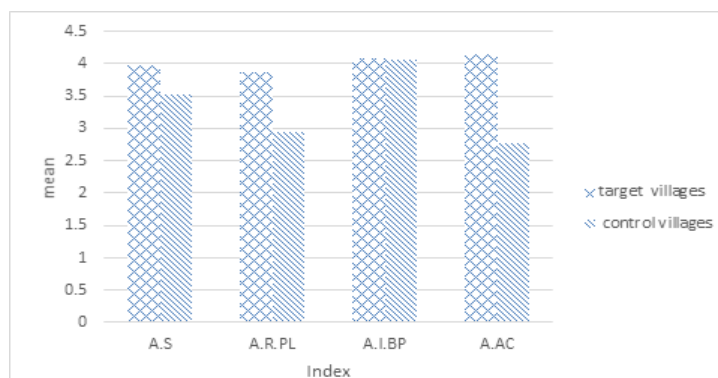


Figure 2. Comparison of the mean of economic aspect indices in the target and control villages, Source: Research Findings, 2019



Table 3. T-test with unequal variance

Index	T	DF	Sig
A.S	4.87	630.24	0.000
A.R.PL	13.07	555.28	0.000
A.AC	15.85	507.2	0.000
A.I.BP	0.326	590.9	0.744

Source: Research Findings, 2019



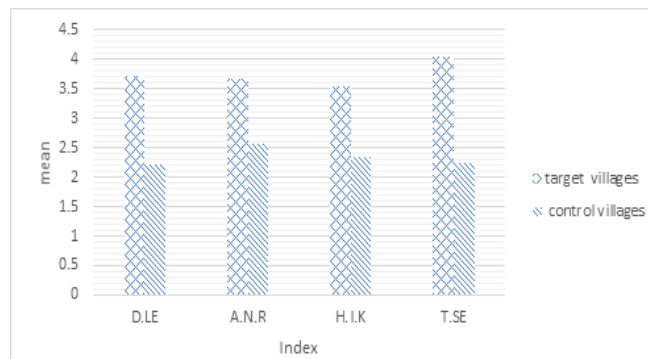
**Social aspect**

To assess the project impact on the social empowerment of women and environmental protection, indicators including "determining the level of enjoyment of natural resources", "awareness of the need to protect natural resources, particularly pastures", "having confidence in indigenous and environment knowledge", and "having talent in the productivity of land and self-employment" were used. In addition, the comparison of mean ranking in Figure 3 shows that a significant difference was observed between the two groups. The output of the Mann-Whitney test, Wilcoxon test and t-test assuming unequal variances in Tables 4 and 5 represents the difference between the two groups. This shows the effects of social

projects on rural women's empowerment as a mediating role in preserving the environment.

**5. Discussion**

This paper examined the mediating role of carbon sequestration project in the socio-economic empowerment of rural women and environmental protection in the control and target groups in the villages of Sarbishe. For this study, economic and social variables in two independent samples were compared using the Wilcoxon test, Mann-Whitney test and t-test with unequal variance. The target sample size was 319, and the control group size was 354. The subjects were interviewed.



**Figure 3.** Comparison of the mean of social aspect indices in the target and control villages, Source: Research Findings, 2019



**Table 4.** Mann-Whitney and Wilcoxon test and mean rank of the indicators

Index	Mann-Whitney	Wilcoxon	Z	sig
D.LE	18141	80976	15.648-	0.000
A.N.R	27044	89879	12.036-	0.000
H.I.K	27378.5	90213.5	11.813-	0.000
T.SE	17294.5	80129.5	15.923-	0.000

Source: Research Findings, 2019



**Table 5.** T-test with unequal variance

Index	t	DF	sig
D.LE	19.77	632.84	0.0000
A.N.R	13.63	667.25	0.0000
H.I.K	13.21	670.93	0.0000
T.SE	20.63	669.66	0.0000

Source: Research Findings, 2019



According to research findings, from an economic point of view, the project could affect all indicators except "women's ability to invest in building processing plants", thus a significant difference was observed between the two groups. In other words, the project was effective in increasing women's ability to save, receive and repay loans, and access to credit and agricultural land.

Improving the economic situation has led to more environmental protection. These are in line with the results of the research by Falsoleiman and Haji pour (2012). The research financial support had been effective in improving the economic empowerment of the target groups. The effects of the project on the social empowerment of women have been positive, and it has drawn much attention to the importance of environmental protection and the role for which they are responsible. This is consistent with the results of studies of Yari and Fakhr (2012) and Maleki and Alipour (2014) and shows that local environmental awareness has a significant relationship with environmentalism corresponding to Engelman's (2016) view. There is a positive relationship between women's empowerment and environmental sustainability.

In total, through the empowerment of rural women by raising awareness, confidence and self-reliance, the carbon sequestration project increases their financial independence and income, which is effective in conserving natural resources and preventing environmental degradation. In addition, it increases their morale to participate in local decision-making and strengthens their self-esteem, but it is not effective in the development of small businesses especially processing industries. It is necessary to provide sufficient financing and training in this area.

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## Conflict of Interest

The authors declared no conflicts of interest.

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