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AGRICULTURAL INTENSIFICATION IN TERMS AGRICULTURAL SYSTEMS (SURVEY OF ALASHTAR LORESTAN PLAIN IN IRAN)

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Abstract

This research examines the processes and conditions of sustainable development through an institutional and alternative approach. The research develops by applying census information, field observations, participatory appraisal, interviews with purposive samples, as well as reports on crop production and has analyzed the differences between the area of land use and yield per unit area using comparative techniques of agricultural land use. The field of study was Alashtar plain in Lorestan province .The purpose of field research was to compare and analyze family farming systems with other agricultural systems. At the theoretical level and review of sources showed that higher the level of agricultural intensification , the greater the relative efficiency of family farming systems has been proven not only in Iran but also in other countries such as Japan, China, and Taiwan, based on research by Lupitten and Susan Green et al. Family knowledge storage responds well to changes in climate and the market, but is also a precursor to the low costs of change, especially technological change, in the use of new innovations and inputs .BUT a survey of agricultural credit granted during the two recent decades shows that more than 80% of the credits and facilities have been provided to users who own more than 50 hectares of agricultural land. And family farms are almost forgotten; calculations have taken place; redistribution of large land units and substantial change in government policies to support family utilization systems will double the production of agricultural products in Iran It is very important that in family farming systems the use of new technologies is avoided because such holders are less technologically savvy and mostly use rental technologies. In large scale agricultural systems such as agro-industrial units the ownership of agricultural machinery such as tractors, combines, and other production tools is much wider and broader. Because of this, such systems have to use older, worn-out technologies and are therefore; especially compared to family farmers; less productive and have less degree of agricultural intensification. In addition, highly valuable and civilizing innovations in Iran such as aqueduct originated from family-owned systems. In recent years a new way of cultivating cucumber under the Crete-plastic units promoted and expanded by family farming systems in **Alashtar** plain and Bijnavand area of Lorestan province. Also, varieties of greenhouse cultivation, mixed cultivation and rice cultivation have been developed by family farmers in Visian area of Lorestan province. As Ali Murad Khan predicted, food security depends on strengthening family farming systems in Iran and the Asian continent.

Keywords; Agricultural Intensification, Family Farms, Sustainable Development, Intensive Labor, Adaptation.

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Introduction

At theoretical level how explained the Institutionalization of rationality approach :Max Weber believe that all societies have responded to increasing agricultural land constraints in a more or less similar manner. All of these communities have moved from fixed crop varieties and land use systems to stable crop systems and sustainable land use, and this process of crop stabilization is tailored to the application of effective technologies on soil stability, with reduced soil erosion, increased, productivity and sustainable yield growth.

In the early stages of stabilization technologies, such as the use of mines and animal labor, were commonly invented by farmers, and the application of science-based and industry-based techniques in the final stages of **agricultural intensification** and at a time when population growth was accelerating rapidly. While some cases and examples show that population and market demand drive productivity growth through stabilization, there are also examples of a negative relationship between sustainability and labor productivity, meaning that stabilization reduces labor productivity. Decrease in productivity is in some cases due to land use and decrease in soil fertility and even crop yields.

Bengali considers the depth and breadth of the problem to depend on the following three basic things:

- the growth rate of the workforce
- the level of institutional orderly dynamics and flexibility
- condition of the cultivation climate (climate, soil type, high humidity and slope of the area).

In this section, we glossing and analyze the institutional and environmental factors affecting crop sustainability based on the results of studies conducted in Africa and Asia; Summarizes the varieties of crop varieties and surface crops into a sustainable system in the following four categories:

- Institutional changes, particularly in the context of the long-term evolution of land use rights, which expanded as population grew but slowed the pace of cultivation.
- Despite prolonged ownership and long-term land acquisition, individual actions and monopolies prevented the formation of a collective action to invest in watersheds to prevent soil erosion.
- In the peripheral areas of investment to prevent soil erosion, the rate of return on investment was very low in both areas (both agricultural lands and peripheral areas).
- Government policies prevented migration from peripheral and eroded areas whose productivity had fallen sharply.

Theoretical Framework

In the agricultural intensification theory and modern theories of agricultural development, family farming systems have a historical heritage, applied cognitive, and fundamental function. In the views of physiocrats, mercantilists, Ricardo's proprietary interest, Asian modes of production, the water-based empire, the law of diminishing returns, classics and neo-classics, Keynesian institutionalism, Marxists and neo-Marxists, and alternative theory; A way of thinking about the efficiency of agricultural systems has been analyzed and explained. In this study, the approach was taken to

Agricultural Intensification

In this new approach with a critique of the principles of polar growth and modernism .It is based on the four principles of territorialism, agricultural diversity, environmental sustainability and institutional arrangements.

These are the principles against the functionalism, standardization, economic growth and structuralism that have been accepted in the theory of modernism.

The results of field research have also shown the distinctions and preferences of each other based on historical, institutional, environmental and livelihood conditions. The following are arguments and examples of empirical findings in view:

- **The advantage of large scale units:**

Both the views of classical and neoclassical economists, modernization theories, and Marxist thought have emphasized the greater efficiency of large-scale exploitation. For Schultz, the concept of agricultural production in Marx's expression indicates a strong orientation in favor of widespread exploitation (Schultz, 1988, p. 114). The key concepts in these views are scale returns, the law of descending returns, the indivisibility of the factors of production, the appropriate scale of production. (McNichel 1990, Schultz 1367: 114, Land and Peasant Issues in Iran 1361, Mayer and Sears 1376, Azkiah 1374, Vosoughi 1366, Higgin1982, Lawrence'1992, Lee1986, Lipton 1985, McNicoll and Cain1990, Malthus17, Palthus 1898, Malthus 1798 and Vo Tong Xuan. 1989).
For these experts, saving on production costs, the possibility of using new technology and inputs, access to market information, specialized activities and the use of specialized labor, ease of use of credits and services (government and banking), commercialization, Centralized and coordinated management of vast lands, increasing agricultural production and productivity growth, improving rural development indicators are the major advantages of large utilization (Raidana 2001, Saadloo 1977, Noori Naini 1356, Mayer & Sears 1376, Binswanger & .1987, 1976; , And.P.Binswanger1984, Ronald1988, Higgin1982, Lawrence'1992).

- **Superiority of Family systems of agricultural production**

Scholars in this view, in particular Bozerup, Colin Clark, Brooklyn Stone, William Clark, Irmaadelman, Raymond Etrop, Walter Glansen, Steven Harel, emphasized the efficiency and efficiency of micro-scale development units, and emphasized the modalities of the Riceland scale.
(Binswanger and.Pingali. 1987-1988; Bosehart2003; Boserup 2000and1981; Bradford 1996; Carr Stephen1982; Gallin. Bernard. 1006; Tamara 2008; Hayami and Ruttan 1971 and 1985; Higgin1982; Lawrence1992; Lipton1985; McNicoll and Cain1990, Pingali, and.P.Binswanger1984, Schultz 2007).
Features and advantages of this type of operation are:

- They are independent and therefore their beneficiaries have high incentives to agricultural intensification and invest more in the unit.
- Supported by family.
- Have a variety of complementary agricultural activities (agriculture, animal husbandry, poultry farming)
- Tend to cultivate user crops.
- Knowledge of indigenous and historical cultural and agricultural background.
- Use the family work force.
- High ability to adapt to environmental and technological changes (Agriculture and Peasant Issues in Iran, 1991)

(Tamara 1982, Hayami & Ruttan1971 & 1985, Higgin1982, Lawrence 1992 Mohsen 1378, Schultz 1367,).
Arma Adelman believes that land reform and expansion of family-owned units in Taiwan, Japan, and South Korea had positive economic and institutional consequences, for example in Taiwan (1949-53).

- High level of income distribution, wealth and us lecithin
- Increasing farmers' motivation to diversify their agricultural activities
- Increasing agricultural productivity
- Agricultural intensification
- Increasing the use of labor force and thus reducing unemployment
- Increasing farmers' demand for industrial goods and inputs
- Increased investment in land
- Economic and food security of the family and expansion of democratic structures in the family

And ultimately the impetus for industrialization (McNickell, pp. 121-178).
Accordingly, while scholars see the previous generation as a barrier to development, scholars of the past decade have emphasized the causal and positive role of the family in determining the nature and

scope of economic development (McNickell, p. 83). In this literature, family systems are emphasized as the visual variables mediated by political and economic powers on the one hand and their economic and demographic consequences on the other.
Extensive research into the role of the family in adopting the Communist system in China and the role of family interaction in accelerating economic development in Taiwan all reveal the causal and positive role of the family, especially in the early stages of industrialization.
Susan Green Hughes argues that family farming systems in Taiwan, China, and Korea outperform the positive influence of family institutions:
Families increase farmers' incentives to diversify capital and labor and move it from traditional to modern, as well as their incentives to diversify economic activities by moving to industrial, commercial, mining and construction activities. The instrument upgrades.
Diversification also comes from economic activities and the provision of capital and labor to families, and the existence of appropriate supportive and secure contexts within families paves the way for the emergence of entrepreneurs. These individuals are usually benefited by economic and material benefits. These are usually in the light of family support and a sense of security that is realized only within the family, as well as the protection of wages and property, private ownership, and the participation and support roles in the family. And freedom to provide benefits, opportunities, and freedom in diversity Ydn to economic activities, take advantage of opportunities to receive: (Susan Green Throat 1985, p. 147)
Family farming systems require low capital and simple technology due to their small size and the costs of switching them are small, given the advantages of small organizations such as low level paperwork and high power to adapt to technological change. Following economic conditions, they can quickly adjust and adjust their capital, labor, production, and management practices. There is the possibility of more work and more efficient division of labor in the family. The family is able to supply many strategic resources including labor, capital and information through social, family, and internal networks, and for centuries of experience trading and being present in the market has not only motivated the abundance of wealth and production, but also the skills Managing and strategically changing to maximize opportunities, for example in China and Taiwan, changing the economic status of children has led to a sharp decline in fertility (Ibid. 90).
All of these features and functions have contributed to the success of family-owned systems in Taiwan and China despite having different economic systems (capitalism in Taiwan and communist in China) (Ibid., P. 91).
On the basis of the above theoretical approach, the research hypothesis, which contains several detailed hypotheses, is:
"The level of agricultural intensification in the operating systems varies depending on the area of operation (especially sub-hectares above five ha)."
Agricultural intensification
Agricultural intensification is a process that leads to the transition from flat-farmed and sustainable farming systems to agricultural intensification and sustainable farming systems (Pingali2019, Boserup1981)

Institutional Factors Affecting Agricultural intensification
Changes in land use rights have been one of the major institutional factors affecting crop sustainability.
In the early stages of social life, and at a low population density, ownership of the land was in a general state, with members of a particular group co-cultivating the land, and after the fall period, the right to use the land again. Other groups or groups were given. As population and property density increased, ownership and land use became more common in high density populations, meaning that farmers with long ownership and land use rights in certain parts of the land were farmed. The process of transformation from public and private ownership to individual and private ownership has been in line with the evolution of the institutional arrangements of societies;
The right to exploit rangelands was also shared individually and publicly, and individuals found the

right to sell land and rangelands to other groups and even to aliens.
Hopkins believes that as the population diminished and shortened, and even eliminated fallow periods, steady-state cultivation and individual ownership became more common.
Raymond Nooroune believes that the right to own land improves farmers' incentives to invest more in their land in order to:

- Stabilization of cultivation and production
- Prevented soil erosion and preserved soil fertility.

In addition to population growth and population density, other factors that influenced agricultural sustainability also influenced the transition from public ownership to private ownership. The most important factors that lead to diversification and delay and precedence in the process of privatization of land tenure among different parts of a country are:

A. Fertility level of soil
B. market access status
C. The level of awareness and operational training

Beyoncé Wrahroyami also found that there were positive and significant correlations between the level of land privatization and the density of population in 1988, by examining the processes of privatization of land tenure and population density in the ten sub-Saharan Africa. had.
They also concluded that:
There was a significant and positive correlation between the degree of privatization of land use rights and the extent of improvement of market structures.
Of course, political power and government policies have played a key role in the transition from communal ownership to private ownership or to the breaking of this process, for example, in colonial Africa, giving Europeans monopoly over indigenous agricultural land and private ownership. It totally disappeared. Also in the sixties and seventies socialist governments in Africa, Asia and Latin America made numerous efforts to eradicate communal and public farming systems and eliminate private ownership.
The most important political factor affecting the generalization of private property in countries such as Iran, Egypt, Taiwan, and so on was land reform.

The right to use land and sustainable agricultural development

Soil erosion and reduction of soil fertility is a process that occurs in line with sustainable agricultural levels, desertification levels and deforestation. Soil erosion is not a universal issue because:
Firstly, the amount of soil erosion varies depending on the type of soil, climatic conditions, rain diets, topographic condition and slope.
Secondly, proper land use and appropriate activities and allocation of necessary funds will prevent soil erosion even in areas with high soil erosion (eg in the Nojian area of Lorestan, one of the tributaries of the Dez Dam Dam) As well as in Alishtar area of Lorestan. Appropriate measures, such as preventing excessive and untimely grazing, watershed management, reduced soil erosion from forty tons to less than eight tons per year.
However, in areas where preventing soil erosion requires collective action in watershed activities, the existence of private and individual long-term exploitation rights has prevented the formation of collective activities and has led to more individual and individual erosion.
Group action in watershed activities and investment needed to prevent erosion have been practiced in areas where farmers have had the incentives to do teamwork and collaboration, and these incentives to cooperate and cooperate in situations where communities and groups are in close contact. Being together and trusting each other, they were more visible.
Agro-climatic conditions and soil erosion trends are much more severe in areas where the return on investment, especially labor inputs, is very low. In the high slopes and highlands that are currently being used for grazing livestock in the wake of expanded security and housing, there is no investment needed to control erosion.

In addition, in arid regions, despite the privatization of land use rights, soil erosion is very severe due to the low return on investment in soil and water conservation.
In semi-arid and mid-elevation areas, both privatization and higher rates of return on capital have contributed to erosion control.
In these areas, the extension of the right to long-term exploitation requires multiculturalism, biological control, supportive and protective tree planting.

Effects of Land Reform on agricultural intensification
The land reform that took place in the 1950s and 1960s in some Latin American, African, African and South Asian countries had different results and consequences.
Arma Adelman believes that land reform in Taiwan, Japan, and South Korea had positive economic and demographic consequences, for example in Taiwan (1949-53):
- High level of income distribution
- Increasing farmers' motivation to diversify their agricultural activities
- Increasing agricultural productivity
- Sustainable cultivation
- Stabilize the use of labor and thus reduce unemployment
- Increasing farmers' demand for industrial goods and inputs
- Increased investment in land

Thus the effects of family systems on economic, social, cultural and food security changes in terms of
- The role of the family in the transfer of ownership from generation to generation
- The role of the main family in the establishment and continuation of newly organized families
- Differences between family systems in terms of the role of men and women
- Differences in fertility levels due to changing economic roles of children

Is different.
The family as a complex organization composed of members, customs, values, abilities, ownership and influence on agricultural development.

Research Methodology
The research method is surveying. For this purpose we used data from general population and housing censuses from 1956 to 2016 and from agricultural censuses from 1960 to 2014 as well as agricultural production reports.
In addition, it was tested in the **Alashtar** area of Lorestan province through a participatory evaluation method. ,
In this study, the discriminate relationships between area of factors and conditions and indices of stability of crop were calculated using differentiation analysis techniques and internal comparison of agricultural land use levels.
The study resulted in the analysis of eight million data from censuses, reports and field operations of ten villages and large-scale farms.

Data analysis and hypothesis testing
Data analysis and hypothesis testing:
Bidirectional hypotheses were tested in two-dimensional analysis and the following results were obtained:
- In Iran, as in many countries, there is a dual farming system. There is both a family farming system and a large farming system.
- Performance per hectare in family farming systems is larger than large scale farming systems
- Entrepreneurship in family farming systems is higher than large scale farming systems

- Food and occupational safety of members in family farming systems is higher than large-scale farming systems.

The cultivation of consumer crops versus capital investment in family farming systems is larger than that of large-scale farming systems.
- Fallow rate and fallow duration in family farming systems is less than large scale farming systems
- Adaptation to changing climate and market conditions in family farming systems is higher than large scale farming systems.
- Innovations in family farming systems are larger than large scale farming systems
- In Iran, both the records of Globally Important Agricultural Heritage Systems and the Nationally Important Agricultural Heritage Systemsrelate to family farming systems.
- The larger the area of operation, the less the sustainability of the crop
- The more technology and agricultural facilities, the more sustainable the crop will be
- The level of development of agricultural infrastructure has a positive and significant relationship with the sustainability of cultivation
- The distance between farms is negatively related to the stabilization process of the crop
- Sustainable cultivation is higher in villages located in plain and lowland areas
- The higher the population's vital density, the more sustainable the culture will be
- Stability of cultivation is higher in humid temperate, temperate and cold humid climates
- The variety of agricultural and livelihood activities has a positive and significant relationship with the process of stabilization of cultivation.

Since there is a significant and significant correlation between independent variables, for example, the greater the distance between villages and service centers:
- Their population is smaller
- The abundance of mountainous villages with cold climates is greater
- The level of development of infrastructure and agricultural facilities is lower
- The total agricultural land and the proportion of irrigated land is lower

Multivariate regression model was used to control the correlation

Level measurement of Agricultural intensification
The important component in this research is agricultural intensification. The following measures have been used to measure this complex concept.
Characteristics of **Agricultural intensification** are:
- Fallow land and its trend from 1963 to 2015
- Ratio of agricultural land to total agricultural land and its trend from 1973 to 2015
- Ratio of cultivated land and its changes from 1963 to 2015
- Ratio of irrigated lands and its changes from 1973 to 2015

There was a significant correlation between the factors used to control the correlations. The factor analysis of the depth indices was performed and the factor regression values were stored as variables in the data file to evaluate its relationship as the depth indices with the variables and indices.
Summary of the process, tests, and results of factor analysis are:

Matrix of correlation coefficients between **agricultural intensification** indices

Size of orchards fertile to the total agricultural land and its growth rate	1	0.860	0.3	-0.725
Ratio of agricultural	-	1	0.860	0 860

land to total land and its growth rate	0.952			
irrigation land ratio and its growth rate	-0.392	0.400	1	0.835
Fallow land ratio and its growth rate	0-492	0.492	-0.725	1

Correlation between all variables was significant at the level of 0.999.
The value of data suitability for factor analysis (K.M.O) was 0.847. This represents the suitability of the data at a very good level for factor analysis as well as M.S.A as well as the suitability of individual variables to enter the factor analysis stage.
The Bartlett Spearman test with approximate value of chi-square function equivalent to 1332725 (APProx.Chi-Square = 13272944) and degree of freedom equivalent to 6 df = 0.999 showed significant difference between the variables matrix and the unit matrix.
Factor analysis was used to analyze the principal component and finally one factor was extracted that accounted for 91% of the variance.
The correlation coefficient of each variable with the factor is given in the table below.

Since only one factor was obtained and the eigenvalues of the other factors were less than one, no factor rotation occurred.
Component Score Coefficient is also presented in the matrix

Matrix of factor scores coefficients

Indices for measuring agricultural intensification	scores coefficients
The ratio of fruitful orchards to total agricultural lands is	0.327
Ratio of cultivated land to total agricultural land	0.357
Ratio of irrigation land to total agricultural land:	0.225
Ratio of fallow agricultural land to total agricultural land of	0.340

The obtained component is called the "depth of cultivation" factor and in later stages, the relationship between the regression values of the cultivation depth factor and each of its reagents with the variables was measure

Depth of agricultural intensification of studied farms in terms of factor values
In order to classify the populations under study according to the depth of agricultural intensification after calculating the range of changes in the regression values of the deepening factor and its distribution in six categories the following results were obtained:

Table () Distribution of studied population in terms of **agricultural intensification degree**

agricultural intensification	**frequencies**	Gross percentage	Net percentage

degree			
1) Very low	2125	6/2	4/7
2) Low	5707	16/7	12/7
3) Medium	9783	28/7	21/7
4) high	9655	28/3	21/4
5) Very high	6830	20	15/1
6) No item	10985	-	24/4
Total	45085	100	100

As shown in the table above, the level of **agricultural intensification** was in more than half of the populations studied at medium and low levels.

Correlation coefficients between the ratio of family farming to whole farming systems with depth-inducing factors

Factors and Variables	R	SIG
1) Growth rate of cultivated lands	0.421	Positive
2) Fallow ratio	- 0.627	Negative
3) The ratio of land under cultivation	0. 118	Positive
4) Yield index per ha	0.625	Positive
5) Agricultural entrepreneurship index	0.835	Positive
6) Innovation Index(GIAS)&(NIAS)	0.823	Positive
7) Increase of irrigation lands	0.345	Positive

As seen in the table above.
With a confidence of 0.999 it can be claimed that;
The higher the level of rural development and infrastructure (roads, communications, electricity, water, etc.): has positive effects on agricultural sustainability

- Entrepreneurship and innovation rates are higher regard to increasing proportion of family farming systems
- The depth of cultivation was higher regard to increasing proportion of family farming systems
- the area under cultivation was higher regard to increasing proportion of family farming systems
- The fallow rate was lower regard to increasing proportion of family farming systems
- The proportion of irrigated land was higher regard to increasing proportion of family farming systems
- Yield was higher per hectare regard to increasing proportion of family farming systems
- The level of deepening in 2017 was significantly higher than in 1993

Distribution of operating units in terms of areas under cultivation of products and user products

Table**()** **Size of agricultural land. agricultural production and Agricultural intensification ratio**

Classes by size and rate	Size of agricultural land(ha)	agricultural production (tones)	Percentage of agricultural land	Agricultural intensification ratio =100
1) Retail farmers	645450	2668550	9/4	25
2) The average peasant	1588210	5231800	18/5	28
3) Average peasants above	2167230	6108460	21/6	20
4) The prosperous peasantry	4617800	9999730	35/3	22
5) Moderate land capitalism	790370	1662470	5/9	3
6) Large Capitalist Lands	379520	943740	3/3	1
7) Large cultivation units	399110	1719470	6	1
Sum	10587690	28334220	100	100

As shown in the table above:

- Degree of agricultural intensification is low in all forms of agricultural exploitation systems in Iran.
- The area under cultivation of twenty-one crops (cereals, cereals, poultry, crops, saffron, forage plants, etc.) in 2017 was 10587690 hectares.
- If the yield per hectare in the above 10 hectares is the same as the family farm, the total crop production will increase from 28334220 tones to 44472413 tones and increase by 1.6 times.
- Of the total land under 6 percent of the less than two hectares, 15 percent of the units between two and five hectares, 20.5 percent of one of the five to ten hectares, 43.6 percent of units between ten and fifty. Hectares and 4.7% belonged to units over fifty hectares.
- The proportion of crops used in smaller units was significantly higher than in larger units, for example, in sub-two acres operating 38.5% of the crops under cultivation of the crop (rice, saffron, legumes, safflower, potatoes, onions, Tomato). Whereas, in units over 50 hectares, less than 5% of land was used for crop production.
- Therefore, in small scale and smallholder farms, the proportion of cultivated crops was higher than that of large scale farms and this difference was significant at the level of 0.999.
- Among rice crop users, saffron and legumes had the highest proportion compared to other crop users, namely pistachio and crop products.

Correlation coefficients between independent variables and agricultural intensification factor

in Alashtar plain of lorestan province

Independent factor and variables	Non-standardized coefficients	Standardized coefficients	sig
Ago climatic density	117/45	0/17	0/0001
The degree or extent of technology and innovation used	260 18	0/2 919	0/0002
Level of local development	389 / 38	0/180	0/0000
Distance from Exchange Centers	730/203	-0/213	0/0001
Topography of agricultural lands	288/1992	0/119	0/0002
Mode of Ownership of Agricultural Land	208/7 49	0/38 0	0/0000
Level of use of indigenous knowledge	351/5 017	0/ 251	0/0001
The rate of investment and intensive activity in agricultural lands	712 2/51	0/1963	0/0002
Constant values	227/143	0/1022	0/0000

As mentioned in the table above:

- Correlation between agro-climatic densities of sustainable cultivation velocity was more positive and significant in **Alashtar** plain. It is necessary to explain that in relation to agro-climatic density: The application of this population density measure as a basis for predicting the level of agricultural intensification and standardization of arable land in terms of soil and climate quality is essential. In 1988, Benson and Vrraprap introduced this measure to standardize the population density, in which the population was measured per million kcal of production potential, termed as agrochemical density (p. 245). This index is more accurate than the previous one, for example Bangladesh ranks first, India ranks third, Kenya is almost middle and Niger last, but for the first time, however. As we rank on this index, the situation is completely different, with India falling to twenty-nine and Nigeria ranked higher than Bangladesh (FAO Survey on Land Resources of Future Populations 2018).
- There is positive and significant correlation between the level of agricultural intensification and the extent to which technology is used and the achievement of innovation in agriculture. It is very important that in family farming systems the use of new technologies is avoided because such holders are less technologically savvy and mostly use rental technologies . In large scale agricultural systems such as agro-industrial units the ownership of agricultural machinery such as tractors, combines, and other production tools is much wider and broader. Because of this,

such systems have to use older, worn-out technologies and are therefore; especially compared to family farmers; less productive and have less degree of agricultural intensification. In addition, highly valuable and civilizing innovations in Iran such as aqueduct originated from family-owned systems. In recent years a new way of cultivating cucumber under the Crete-plastic units promoted and expanded by family farming systems in **Alashtar** plain and Bijnavand area of Lorestan province. Also, varieties of greenhouse cultivation, mixed cultivation and rice cultivation have been developed by family farmers in Visian area of Lorestan province. As Ali Murad Khan predicted, food security depends on strengthening family farming systems in Iran and the Asian continent. The author's anthropological observations and studies have shown that the ability of family farming systems to foresee and adapt to changing natural and environmental conditions is far superior to other agricultural systems. For example, it was only in family farming systems that barley was replaced by wheat in drought years because it required less water.

- In areas and villages where infrastructure development such as roads and access to safe drinking water, electricity, health, education was higher: the level of sustainable cultivation was also higher. However, in Iran and in **Alashtar** plain as well as in Bijnvand area of Lorestan province, the negative and decreasing process of agricultural intensification due to underdevelopment and migration of farmers in rural areas and mountainous habitats has increased.
- There is a significant and negative correlation between the distance from exchange centers and markets to the level of development.

Farmers who have easy access to markets also have more crop production. Under these conditions, the process of agricultural intensification have to two causes:

- Higher prices and constant demand for agricultural products which signify an increase in the final benefit of the activity and encourage farmers to produce more. In biran's case, then, farmers would plant more crops and try to increase their production levels as much as possible.
- Increasing labor income and wages, along with decreasing travel and transportation costs, leading to labor migration from other regions to the region. Research by Elif in 2019, Cortin in 2018, and in work in 2012 show a positive and significant correlation between the level of agricultural intensification with:
- Improved transportation facilities
- Proximity to exchange centers

(Bengaluru, p. 249).

Clarke in 2016 Bazhart in 2018, and John Logman in 2014 also conclude: The process of changing the agricultural system from agronomic systems to constant cropping in a given climate situation is subject to population growth and increased levels of farm income. In their view, the increase in farmers' income is also subject to two factors:

- The level of development of commercial structures such as transportation
- The level of price increase for agricultural products (Ibid. P. 244)

Given the above results and the findings of more than twenty case studies, such a conclusion can be drawn.

Variables affecting agricultural sustainability in family production systems:

In multivariate and regression analysis, the advantages of family systems of agricultural production was significant at the 99% level.

In all the following factors and variables Family farming systems are superior and better than large-scale farming systems

- Indigenous knowledge utilization rate
- Level of access to technology and agricultural facilities
- Job security and livelihood
- Market access

- Type of product production system
- Innovation in agriculture
- Degree of adaptation to environmental and market changes
- Type of crops (planting crops that need more activity, such as rice and vegetables)

The common variance between these variables and the values of agricultural sustainability factor were equal to 80%.

Conclusion

The effects of family farming systems on crop production and food security as well as economic, social, cultural and family changes vary according to the following factors:

The role of the family in the transfer of ownership from generation to generation

- The role of the main family in the establishment and maintenance of newly organized families

Differences between family systems in terms of the role of men and women

- Differences in fertility levels due to changing economic roles of children

Is different. For example, the existence of consensual family systems plays a central role in reducing fertility, reducing childcare costs, and realizing private property (Ibid., P. 18).

While scholars see the previous generation as a barrier to development, scholars of the past decade have emphasized the causal and positive role of the family in determining the nature and scope of economic development (McNickell, p. 83). In this literature, family systems are emphasized as the visual variables mediated by political and economic powers on the one hand, and the economic consequences and their family systems on the other.

In this regard Tamaraharoon's research is most relevant. In 1982 he analyzed the role of family time in influencing the industrial time space of the late nineteenth and early twentieth centuries in modern New England (p. 83).

Extensive research into the role of the family in adopting the Communist system in China and the role of family interaction in accelerating economic development in Taiwan all reveal the causal and positive role of the family, especially in the early stages of industrialization.

The socio-economic structure of the family due to its small size.

- It requires low capital and simple technology and the costs of changing it are small (compared to large organizations)
- Benefits of small organizations such as low level paperwork and high power to adapt to technological change.
- Following the economic conditions, they can quickly adjust and adjust their capital, labor, production and management practices.
- There is the possibility of more work and division of work in the family.
- The family is able to supply many strategic resources including labor, capital and information through social, family and internal networks.
- After centuries of trading experience and presence in the market, not only has the incentive to maximize wealth and production but also changed the management and strategic skills to make the most of opportunities, for example in China and Taiwan, changing the economic situation of children has caused a sharp decline. Fertilized (p. 90).
- With a long experience of acquiring the risk of an economic activity, they have adopted a diversification strategy.
- With favorable economic security, it has enabled the development of entrepreneurial spirit.
- By diversifying workforce activities according to age, gender, skill, experience and knowledge, it provides maximum productivity and specialization of the workforce.

All of these features and functions have led to the success of family-owned systems in Taiwan and China despite having different economic systems (capitalism in Taiwan and communist in China).

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