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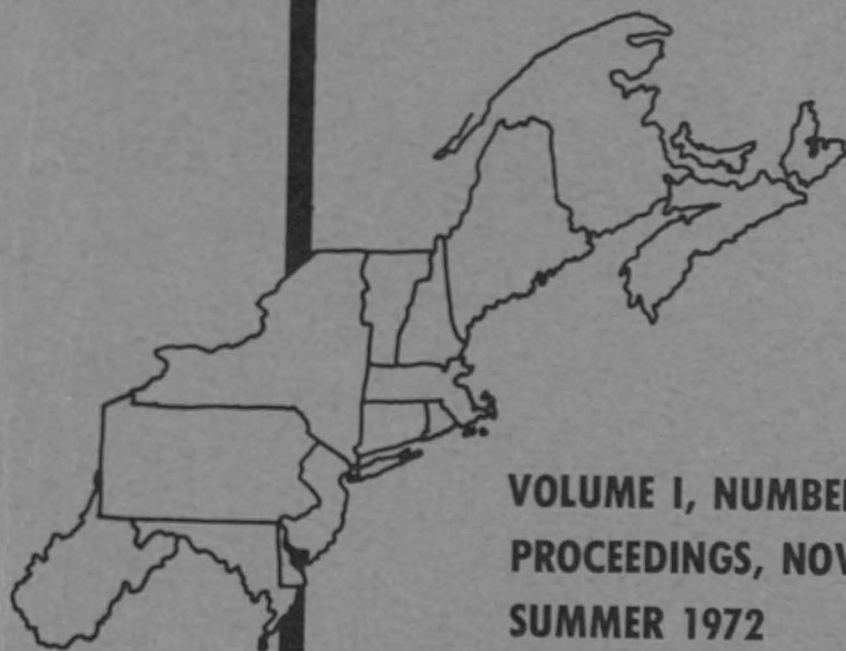
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"FARM CORPORATIONS" ON THE DEZ -
IRAN'S APPROACH TO RURAL DEVELOPMENT

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Shamsabad is a small rural village in the Khusestan region of southwestern Iran and within sight of ancient Persepolis, the magnificent city of the Persian Empire. In 1969, its 80 farm families and 60 laborer families were living at near subsistence levels in a mud-walled village about the size of 20 city blocks. They were dependent upon a non-technical and comparatively primitive agriculture which had existed in the region for many generations.

This was to be the site of the first farm corporation organized under the terms of the Farm Corporations Law of 1967. Aryamehr, as the corporation came to be known, now controls the Shamsabad village lands of 1600 hectares and is owned by 80 farmer-stockholders. The corporation is managed by a small team of technically trained agriculturists under policies established by a Board of Directors elected by the stockholders. The labor force is made up of farmers, laborers, and their families.

Aryamehr was organized under the aegis of the Ministry of Land Reform and Rural Cooperatives. Its role was complemented by the con-

^{1/} Chairman, Dept. of Agricultural Economics and Marketing and former Sr. Agricultural Economist for Development and Resources Corporation. During 1970, the author served as a member of a team of agricultural and engineering specialists who assembled in Andimishk and Tehran, Iran to evaluate the advisability of utilizing the farm corporation concept in the development of the DEZ Irrigation project. This paper is largely drawn from the team report. Although the economic analysis in the D & R report was the responsibility of the author, he is indebted to other team members including: Hon. William Warne, Team Leader; Dr. Fenton Sands, Agronomist; Mr. Raymond Anderson, Livestock Specialist; Mr. John Freivalds, Agricultural Economist; Mr. Jack Ericksen, Civil Engineer; Dr. John Vaughn, Chief Agricultural Advisor-Iran; Mr. Lyle Wilcox, Farm Management Specialist-Iran; Dr. Mehdi Yazdi, Director of the DEZ Irrigation Project; Mr. Hedayat Tabib, Director of Safiabad Trial Farm; and Mr. Paul Micou, D & R - Iran. The study would not have been possible without active support by the Iranian government and D & R management (David E. Lilienthal, President).

struction of a model village by the Ministry of Housing. Each farmer was provided a house on a 20,000 square foot lot.

When Irving Olsen^{2/} visited there in 1969, he found a finished village ready for occupancy with a water and sewer system, electricity, school, cultural center, carpet weaving center, mosque, offices and grain storage. The corporation was not charged with the cost of the village. The individual farmers were paying for their homes on an installment basis.

Initially, the plan was met with skepticism on the part of stockholders. Few of them expected to receive the promised dividend based on their share of stock. In June 1970, after the farmers had received their first dividend of 70,636.5 rials each (about \$930) their reluctance quickly turned to one of enthusiasm.

Warne reported that farming practices were changing.^{3/} They were using pesticides, machinery, and irrigation on an expanded hectareage. Yields of sugar beets were up from 10 to 33 tons per hectare. They were utilizing an improved water supply.

By the summer of 1970, some 20 farm corporations had been organized. Not all were as successful as Aryamehr but morale was high as the word of the Aryamehr dividend got around.

Why Farm Corporations?

In its fourth 5-year (1968-1973), Iran established targets which would bring increases in agricultural productivity in line with that achieved in the industrial sector during the three preceding planning periods. A review of the DEZ Irrigation Project revealed that:

...Farm demonstration and extension programs...achieved increases of up to 300 percent over preproject returns through improving traditional farming in the Pilot Project area.^{4/}

^{2/} Farm Corporations on the DEZ Irrigation Project, D & R Corporation, Part I, August 1970, p. A-35. Mr. Olsen visited Aryamehr on a credit study under contract with D & R Cor.

^{3/} Farm Corporations on the DEZ Irrigation Project, pp. A-39 - A-50.

^{4/} Ibid. p. 4.

Yet the progress in land leveling and preparation was slow and the development of the irrigable lands were "unsatisfactory." It was deemed that a plan for traditional agriculture, under which individual farmers controlled small plots with limited capital, could not bring about the desired productivity within an acceptable time frame.

There was a need for a development "instrument" which, as David Lilienthal put it, "combined the principal social benefits of land reform and the economic improvements resulting from large-scale consolidated agriculture."^{5/} The Aryamehr experience was to be brought to bear to help determine whether farm corporations might be viable on the DEZ.

The DEZ Irrigation Project

The DEZ Irrigation Project (DIP) is located on a broad alluvial plain along the DEZ River in the Khusestan region of Southwestern Iran just north of the Persian Gulf port of Abadan. The project comprises the construction of a large hydroelectric dam at the headwaters of the DEZ River, the delivery system of irrigation water to approximately 100,000 hectares of land, and a development authority for the region. The Khusestan Water and Power Authority (KWPA) is a regional agency with broad powers to promote the development of resources in the Khusestan. In concept it is not unlike our own TVA.

The potential agricultural productivity of the DIP is enormous. The topography, soils, and climate compare favorably to the central valleys of California. Tests at a Trial Farm near Safiabad in the Pilot Area of the DIP indicate that much of California agricultural technology can quite readily be adapted to DIP conditions.

A DEZ Pilot Irrigation Project (DPIP) comprising nearly 20,000 hectares was identified for Stage I development. Initially, 9,006 hectares were to be reserved for the development of traditional agriculture with small holdings by individual farmers. An extension service was provided to assist the farmers on production and marketing problems. KWPA provided credit to farmers and operated a centralized machinery service. Several villages owned small tractors and limited equipment while KWPA provided the large equipment such as combines, land preparation equipment, and the like. During the 1970 crop year, the extension activity was sharply curtailed due to budget cuts and the effectiveness of the machinery service lessened markedly.

The remaining land in the DPIP was allocated to "agribusiness." These were to be large-scale private enterprises (4500 to 10,000 hec-

^{5/} Letter to H. E. Mansour Rouhani, Minister of Water and Power, Imperial Government of Iran. Published in Ibid D & R Report.

tares each) which would be capable of bringing their own capital and production and marketing know-how to the region. The land was leased from KWPA, but the agribusiness company was responsible for final land leveling. Water was to be delivered by gravity through the project system. The agribusiness companies operating on the DPIP when this study was undertaken were consortiums of California farmers and oil, chemical, and machinery companies. Iranian interests were also directly involved.

The Haft Tapeh Sugar Cane Plantation is located adjacent to the DPIP and is representative of a third tenure system for development of the project area. It has a cropped area of about 4300 hectares. The land and processing facilities are owned by KWPA. It is managed and operated by a Management Consultant firm under direct contract with KWPA.

The purpose of this study was to determine the economic and cultural viability of establishing farm corporations as authorized under the 1967 law on the 9006 hectares of land initially held for traditional agriculture. There was justifiable concern that the farm corporations might not be able to successfully compete with their agribusiness neighbors in production and marketing efficiency. There was concern that the necessary management skills might not be forthcoming. It was readily conceded that production and marketing considerations could not be treated solely as an internal Iranian matter. Success of the enterprises depended upon performance in world markets such as the Persian Gulf states, Pakistan, Japan, and Western Europe.

Land Reform

The success of farm corporations on the DEZ is obviously dependent in part upon the social benefits to be derived from the venture by the participating farmers. If they have strong ties to the land and become socially disoriented by the new order, it may not be possible to meet the targets of the Fourth Plan through farm corporations any better than traditional agriculture.

Land tenure systems and concepts have strong roots in Moslem law. Under this law, if a farmer were to farm a parcel of land for more than one year he would be entitled to a "root" right or a claim to the land. Prior to land reform, landlords, through their Kadkhoda or overseers, would assign farmers to a different piece of land each year. As a consequence, a farmer did not own or lease "his" land, but rather, he owned an indefinite right to land as assigned. This indefinite right was known as a "joft" and was defined as the amount of land one man and two mules could farm in one year. The actual hectarage in a joft would vary depending upon the crop under cultivation.

Land reform in Iran commenced during the 1950's when the Shah-in-Shah ordered the distribution of some of the land belonging to the Pahlavi estates.^{6/} The Land Reform Law of 1960 provided that no land owner could hold more than 400 hectares of irrigated land or 800 hectares of non-irrigated land. Due to a lacking effective cadastral survey, means of implementing the law were difficult.

The law as amended in 1962 gave a firmer base for administration. It was more acceptable in several respects. It fixed compensation to be paid to land owners for properties taken on the basis of taxes paid. It limited holdings to one village, that is, the village, not the farmer, gained title to the land. It allocated land to the peasants without changing village field layout. Farmers were required to join a cooperative society (in the village) in order to qualify.

This law was not without its problems. Lambton reported:

The foundations had been laid for the emergence of a self-reliant and independent peasantry, but this could not be achieved without a rise in living standards. The problem of increased productivity had still to be tackled on a large scale....^{7/}

Under the new law the Kadkhoda was no longer the spokesman for the landlord but his function was still needed. He now was directly responsible to the "bonkus" or "groups of farmers." Farmers in a bonku are usually members of a family or close friends and cooperated in their farm duties. The bonku leader is usually elected and directs the farming activities. There remained also the practice of shifting land assignments under the joft concept. Lots are usually drawn to determine the actual land to be operated by a member of the bonku.

The new system was, therefore, not a sharp departure from tradition. In many ways the village replaced the landlord as the owner of the land, and the role of individual farmers didn't change substantially. In fact, he did not expect to own a specific parcel of land in "fee simple."

The imposition of a farm corporation is viewed as a next step in land reform -- one that would assure farmers their share of the land, and enable the development of large scale efficiency to which the land is well adapted.

^{6/} For more detail see Lambton, A.K.S., The Persian Land Reform, 1962-1966, Oxford University Press, 1969.

^{7/} Ibid.

The Farm Corporation Concept

The declared policy of the Farm Corporation Law is:

...to increase the per capita income of farmers, to create widespread facilities for farm mechanization, to acquaint the farmers with modern methods of agriculture, to utilize the maximum existing manpower in the villages..., to prevent the break-up of farm lands into uneconomic units....^{8/}

Clearly, it is intended that large scale modern agriculture is to be fostered. The companies formed under the law are envisioned to be joint stock companies of farmers. The shareholders are limited to farmers, leaseholders of land and other small land owners. Each farmer, upon incorporation deeds his property or joft over to the corporation in return for stock, the amount of which is determined by the amount of land or jofts he may own.

Other provisions of the law include:

1. Shares of stock may be sold, purchased, or inherited,
2. At the outset of the corporation, the manager and accountant are employees of the Ministry of Land Reform and Rural Cooperatives. Following an initiatory period, such personnel are to become employees of the corporation.
3. Careful records must be maintained and are subject to audit. A financial reserve based upon 15 percent of net earnings must be maintained.
4. Capital may be borrowed at 4 percent interest with a 5-year moratorium on payment of principle. When due, mortgage payments must be made before dividends are paid to stockholders,
5. When at least 51 percent of the farmers in a region elect to form a farm corporation, the action is binding upon the remaining 49 percent as well,
6. A 3-man commission can be established by the ministry to handle grievances between shareholders or employees and the company,

^{8/} Article 1. Law for Formation of Farm Corporations, as amended.

7. Income taxes on company earnings are not levied during first 10 years,
8. A detailed evaluation will be performed by the ministry annually for the first five years,
9. A Centre for Rural Studies and Research shall be established,
10. The corporation shall operate under the terms of a set of Articles of Association (by-laws), and
11. The corporation is a legal entity and may trade and contract in its own name.

The D & R team observed that farm corporations existing in 1970 were operated such that the role of a shareholder as an owner was separate and distinct from his role as an employee. Employees are paid wages without regard to whether they are shareholders or not except that shareholders and their families are to be given preference in hiring. Individual shareholders receive stock dividends in accordance with the shares of stock held and corporation earnings.

The following elements differentiate the farm corporation from a collective or state farm as organized in the centrally planned economies of the USSR or Eastern Europe:

1. The capital of the corporation is owned by the stockholders in proportion to the amount of stock held and is not owned by the state.
2. Shares of capital stock are saleable and may be inherited.
3. Compensation of employees is dependent upon work performed and is not related to whether or not one is a shareholder.
4. It is not necessary that an employee be a shareholder not must a shareholder be an employee.

Shareholders are entitled to dividends on stock regardless of where he works.

Economic Feasibility on the DEZ

A detailed study of the 9006 hectare farm corporation lands in the DPIIP was undertaken to determine probable size of the corporations which might be organized. The boundary lines were drawn while taking the following factors into consideration:

1. Historical working relationships between village units,
2. Proximity to roads and water delivery systems,
3. Type of agriculture presently underway,
4. Soil and topographic considerations,
5. Ethnic differences,
6. Ownership and tenure patterns,
7. Number of village units and population characteristics, and
8. Agricultural practices.

The D & R team concluded that four large farm corporations could be developed in the 9006 Ha. area. Recommended farm corporation units varied from 1578 net irrigable Hectars for No. 1 to 1977 for No. 111 (Table 1). It was estimated that over 5700 persons were residing in the 9006 Ha. farm corporation area of which 1255 were males aged 16-50.^{9/} The availability of a ready labor force was considered to be a favorable factor in the development of a rather intensive agriculture.

Table 1. Possible Division of 9006 Farm Corporation Lands into Corporate Units

Item	Farm Corporation				Total
	I	II	III	IV	
	-----Hectares-----				
Gross Area	2487	1903	2577	2039	9006
Gardens & Villages	198	68	37	52	155
Roads, Canals, etc.	228	276	238	184	926
Non-irrigable Land	483	---	---	---	1001
Net Irrigable Hectarage	1578	1559	1977	1610	6724

Source: Farm Corp. for the DEZ Irrigation Project, Part II, p. 111.

As a means of simplifying the economic evaluation of these lands, a simulated farm of 1500 net irrigable hectares was computed. Four

^{9/} Farm Corp., for the DIP, Part II, p. 144.

alternative production patterns were defined and budgeted. The examples are based upon available knowledge, data and experience concerning soils, climate, plant varieties, and climatic factors as well as economic factors in the project area. The crop and livestock enterprises were selected according to their profitability and our conviction that such enterprises can, in fact, successfully operate under DIP conditions. The farm corporations were not expected to engage extensively in highly speculative crops, particularly during early years of development, however.

While the simulated alternative farm plans are realistic in terms of project conditions and reflect actual production and income possibilities, they are not intended to be blueprints for development of particular farm corporations, but rather, they are guides. They indicate probable costs and returns under alternative cropping patterns and associated organization and management. The examples were prepared in sufficient detail to serve as a basis for individual farm planning if management of a corporation chooses to follow one of them or to mix them. Space will not allow a presentation of detailed cropping patterns, machinery lists, labor requirements, and the like for each alternative. Such details are in the original D & R report.

A cash flow and determination of the incremental net benefit was computed for each alternative. These data were in turn used to compute the internal rates of return. The analysis assumes that the corporation lands be developed over a period of three years; and that several years are required to reach potential yields once the land is in production. All alternatives are assumed to be fully mechanized.

The alternatives are defined as follows:

- I. General Cropping: This is a long term cropping rotation based upon grains and alfalfa with smaller hectarages devoted to sugar beets, grapes, vegetables and sunflowers.
- II. Intensive Cropping: In this case, a short term rotation provides for the intensive cropping of grains, vegetables, sugar beets, and beans. A higher level of management is required than for Alt. I.
- III. Intensive Alfalfa: This rotation assumes that 75 percent of the land is planted to alfalfa at any one time. It is fully mechanized and would likely be a favorable enterprise mix if an alfalfa dehydration unit is built in the project area.

- IV. General Cropping - Livestock: A livestock feeding operation is added to Alt. I above. It is assumed that it takes five years to increase the number of stock fed to the point where all the milo grown on the farm is utilized along with sufficient alfalfa to balance the ratios. About 17 percent of the farm's land resource would be used for feed production.

General Cropping:

The production possibilities under this alternative are impressive. On a 1500 hectare farm, the gross value of production at Iranian prices would be about \$876,000 per year (Table 2). Such a farm could produce 8,600 metric tons of alfalfa, 1660 metric tons of wheat, 1420 metric tons of milo, and lesser but significant amounts of grapes, sugar beets, etc. This assumes that only 10 percent of the land would be double cropped.

The initial capital investment would be nearly \$1.2 million, a major share of which would be for land preparation and subsoiling. At least \$260,000 would be required for machinery. At full development, the net income available for taxes (after the first 10 years), debt service, operating reserves, and dividends to shareholders can amount to a half million dollars annually. Net returns for bonuses and dividends are likely to reach \$265,000. The internal rate of return is 31.8 percent.^{10/}

Intensive Cropping:

From a technical agronomic point of view, the intensive cropping of vegetables, root crops, and grains is a feasible and advantageous use of land. However, a superior level of management ability is essential to handle such a complex operation. Given time, managerial consultant services could make it possible. The farm would be capable of producing 18,000 metric tons of sugar beets along with 4500 metric tons of wheat and milo, 900 metric tons of beans, and lesser amounts of vegetables.

Initial investment amounts to nearly \$1.2 million but can produce a net income for bonuses and dividends of \$375,000 annually at full development. The internal rate of return is 39.2 percent.

^{10/} The IRR is the highest rate of interest a project could afford to pay and still retire the debt during the life of the project. It is determined at the point where the sum of the discounted incremental net cash flow for the project life is zero.

Table 2. Summary of Investment, Costs, and Returns on Selected Farm Corporations on the Dez Irrigation Project

	Alternative Cropping System			
	General	Intensive	Intensive Alfalfa	General-Livestock
	- - - - -Thousands of Dollars- - - - -			
A. Initial Development Expenditures:				
1. Land Preparation and Subsoiling	728.0	750.6	750.6	750.6
2. Buildings and Grounds	110.1	138.0	97.2	272.8
3. Water Supply and Waste Disposal	17.8	17.8	17.8	17.8
4. Improvements in Laterals and Headgates	52.0	52.0	52.0	52.0
5. Machinery and Equipment	260.0	228.2	204.2	283.2
6. Total	1,167.9	1,186.6	1,121.8	1,376.4
B. Annual Costs and Returns at Full Development:				
7. Value of Agricultural Production	876.0	1,057.7	826.7	1,170.0
8. Less: Direct Agricultural Costs	352.5	382.5	375.0	708.4
9. Managerial Consultant Services	10.0	10.0	10.0	10.0
10. Land Preparation and Facilities Cost	10.0	11.0	9.7	19.8
11. Net Income before Taxes and Debt Service	503.5	654.2	432.0	431.8
12. Less: Average Capital Repayment (15 yrs) ^{a/}	77.9	79.1	74.8	91.8
13. Interest on Investment ^{b/} at 4 percent	46.7	47.5	44.9	55.1
14. Net Income before Taxes	378.9	527.6	312.3	284.9
15. Taxes at 25 percent of Item (11) Less (13)	114.2	151.7	96.8	94.2
16. Net Income Available for Dividends and Bonuses	264.7	375.9	215.5	190.7
17. Internal Rate of Return	31.8%	39.2%	31.0%	21.5%

^{a/} Assumes a 5-year moratorium on capital repayment.

^{b/} Exclusive of land values.

Intensive Alfalfa:

Due to the favorable conditions for the production of alfalfa, the general shortage of livestock feed in Iran, and a ready market for dehydrated, pelleted alfalfa overseas (particularly Japan), there is a strong interest in the production of alfalfa in the area. Assuming that 75 percent of the land is in alfalfa, total production on a 1500 hectare farm would exceed 20,000 metric tons. In addition, it would produce 1050, 2230, and 7125 metric tons of wheat, onions, and sunflowers, respectively. A \$1.1 million investment could produce net returns to shareholders of \$215,000 a year for an internal rate of return of 31.0 percent.

General Cropping - Livestock:

The general shortage of meat supplies in Tehran and other major cities in Iran, and a concomitant shortage of animal feed supplies, has prompted an intense interest and speculation on the use of the DEZ as a livestock production center. We accordingly elected to compute returns should a livestock feeding operation be added to the general cropping model above. Such feeding operations are new to the area and one would be wise to start small. We assumed that 1790 head of cattle and 9740 head of sheep would be fed out during the year. The initial investment on such an operation would be \$1,376,400 for an annual return of \$278,200, a relative decrease from alternative 1. The net return to the feed-lot operation proved to be negative at prevailing prices for feeder stock and city meat prices. The internal rate of return is 21.5 percent.

Under present conditions in Iran, it is difficult for a seller to secure a premium price for a premium carcass or cut of meat. ^{11/} Until such conditions change, feed-lot operations will not be profitable on the DEZ. If the sale price of sheep were to rise by 10 rials per kilogram and beef prices were to increase by 8 rials, the internal rate of return would amount to 30.2 percent, certainly an acceptable level.

There is some indication that the present fixed price system for carcass meats will be modified to allow recognition of premium values of better grade animals. Should this occur, the DEZ might well become a major meat animal production center for the country.

^{11/} For more detail on the Iranian meat market see:
D & R Corporation, Feasibility of Livestock Operations
on the DEZ Irrigation Project in Iran, 1970.

Brown, Dr. N., A Survey of the Supply, Marketing and
Consumption of Meat in Tehran, FAO, 1967.

In Summary:

There is little doubt that given good management and sufficient capitalization, farm corporations can be viable on the DIP. The success or failure will depend largely upon the efforts to develop the human factor.

Safeguards

In spite of the rather optimistic picture of the economic productivity of farm corporations on the DIP, there are several matters that must be attended to before full scale production can get underway. First, there is the question of marketing the goods once they have been produced. The productive capacity of the region is enormous and it will not be easy to find ready markets for the amounts available for sale. Our economic estimates reflect this problem somewhat by using relatively low prices, even by Iran standards.

Secondly, there is a possibility of creating an unemployment, or perhaps underemployment problem, if full scale mechanization is adopted. Yet mechanization is essential to the productivity levels which the Iranians are seeking. This labor problem can be alleviated if larger quantities of labor intensive crops are grown, particularly vegetables and grapes. Such an approach would likely render the marketing problem all the more acute, however.

Thirdly, provision must be made for expatriate consultation during the early years of development. The D & R team recommended that a management and technical assistance program be organized to assist in this crucial task. They envisioned the appointment of a regional farm corporation coordinator with marketing and financial and accounting advisors immediately responsible to him. The marketing advisor would have a two-fold task to assist in market development and the organization of regional marketing and processing cooperatives. The financial advisor would be expected to build expertise in financial management and accounting.

And finally, the whole process should be organized to avoid any precipitate social disorientation. Fortunately, the farm corporation concept is not far afield from the Stage II land reform condition wherein the villages held title to the lands and directed their use. There is a need to assure the Iranian family of a meaningful social life whether it be through model villages, improved services, or a gradual improvement resulting from new found affluence.

Whatever the outcome of the Iranian experiment, it has made an impressive start.

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