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THE EFFECT OF REGIONAL SERVICE LOCATION ON THE WILLINGNESS TO CO-OPERATE: A RURAL CASE STUDY*

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Abstract

The purpose of this study is to explore the degree to which physical proximity to services has an impact on the success of regional co-operation in service provision in a rural region in Israel. Proximity was measured by three levels of distance; from the farm to the village, subregional and regional centers. Co-operation was measured by the willingness of the population to use the services in a given distance, cost and quality.

The findings were based on data collected by a field questionnaire that sampled 18 percent of the population (110 cases) of the Ta'annach region in northern Israel. Analysis of the findings showed distance to be a factor that could explain, in addition to other reasons, some of the cases where co-operation failed in the past. The data have also indicated a proper distance to be an important prerequisite to future success of co-operation in selected services. Also the population has shown a willingness to pay more for the same services in order to have them located nearer.

The findings have important implications for regional planners who in the past have relied largely on economic considerations in making location decisions. Service provision planning has tended to maximize economies of scale and consequently greater emphasis has been given to the concentration of important services in a single remote regional center (6,500 meters away) which has not encouraged co-operation. The findings indicate that when regional co-operation is desired, more emphasis should be given to the development of facilities in villages and subregional centers (400 or 700 meters away) which were preferred as locations for services by the population due to their proximity. If such a policy were adopted it would have an impact on the number, size and quality of co-operative regional services and consequently on the cost of their provision and on the future physical form of the region.

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Regional Co-operation

In rural development schemes prepared during the last three decades regional co-operation was advanced by planners as an important means to insure the success of regional growth, Glikson [4], Halperin [6], Prion [10], and Weitz [16]. Co-operation has been defined as the voluntary organization of the inhabitants in a region into a framework of ownership, management or development of economic means of production or social activity.

Regional co-operation as a development tool is found in various forms. Weitz [15] has defined co-operation as a framework for overall regional action. Cohen [2] and Rokach [12] see it as a means to enable the individual to benefit from activity and services to which he would not otherwise have had access, due to high cost and economic inefficiency. In their documentation of regional co-operation as it was practiced, Cohen and Leshem [3] found co-operation to exist as a system of interrelationships among geographically related settlements that included many types of relations which differed in subject and form of organization. In their research they found regional co-operation to exist in all aspects that motivated individual settlers or whole settlements to enter into a permanent system of relationships. Such a system was defined by an organized decision making framework required to carry out decisions made by participants in the co-operative process. The subject of co-operation was of wide range and included the development and running of a regional high school, building of cold storage facilities or setting up a regional marketing organization.

The most characteristic prerequisite for the phenomena of co-operation to exist is the willingness of the settlers to make a trade-off between their agreement to adhere to the principles of co-operation that were set by the members and their obtaining benefits from the services and facilities that they otherwise could not have.

There is a general agreement on the advantages of regional co-operation where it was studied. Rokach [12], Weitz [15, 17] and Shapira [13] have all emphasized the importance of regional co-operation in increasing farm efficiency, farmers' income, technology transfer, financing and specialization. They also found that it contributed to the organization of buying and selling services as well as the improvement of the general level of public and economic services and facilities' availability. In addition, it was found that the stability of the rural population was improved and the level of its social interaction increased. Shapira [13] sums up the value of regional co-operation as being the main tool, at the present, that enables a closing of the gap, typical of rural regions, between highly achievable economic advances and the slowly changing cultural conditions of the rural population.

Regional co-operation also has spatial functional dimensions. There is ample documentation of the physical forms of regional co-operation that have developed or have been planned. Analyzing the forms which have evolved in several rural regions in Israel, Prion [10] has distinguished between two frameworks of regional co-operation, the centralized and the dispersed. Cohen and Leshem [3] found that co-operation in the former type is characterized by (1) a concentration of activities in one central location; (2) management of

activities which are highly organized by one supervisory body; (3) co-operation which includes many subjects; (4) a relatively small number of participating settlements; and (5) participants who tend to be from areas near the co-operative center housing the economic and social facilities.

Unlike the concentrated type, the dispersed model of regional co-operation is characterized by only a limited number of co-operative activities but involves large numbers of participants from many geographically unrelated areas. There is a high degree of dispersal in the location of facilities and in the form of administrative organizations responsible for area co-operation.

Obstacles to Co-operation

Even though co-operation provides many advantages, it is not easy to achieve success in regional co-operation. Several factors were identified particularly with the Ta'annach as well as in other regions as reasons for the failure of regional co-operation to materialize fully. Van den Broecsk [14] indicated as reasons (1) the settlers' unacceptance and/or lack of understanding of co-operative principles, and (2) their unwillingness to place regional long-range interests above local short-range ones. These were cited as factors that would have to change in order to improve co-operation. Israeli [7] and Weitz [17] saw the region's size as an important factor. They found that small regions which cannot provide a high level of services tend to impede co-operation since settlers rely on outer regional services for their needs. Yalan [20], studying the level of co-operation in agrotechnical services sharing found a low level of co-operation to exist due to a lack of expert administration and management skills. Ya'acobi [18] mentioned as reasons the lack of common economic interests and a high degree of ethnic heterogeneity among the population. Other studies have found the lack of parallel between governmental-municipal organization units and co-operation units as a hindrance to successful regional co-operation.

While socio-economic and administrative factors and spatial-functional relationships have been observed and investigated, there is still very little knowledge or understanding about the contribution of a region's physical layout as a factor in the facilitation of successful regional co-operation. By undertaking this study it was our purpose to identify the degree to which there exists a causal relationship between the level of co-operation in a region and the physical-functional arrangement of that region's settlement and communal facilities.

To answer this question we studied it in a preplanned and highly co-operative region in Israel. An empirical study was carried out using a field questionnaire that was answered by 18 percent of the region's households. The data gathered made it possible to draw conclusions on the importance of the physical layout of a region to the willingness of that region's population to co-operate and to the success of regional co-operation efforts.

The Ta'annach Region as a Case Study

The Ta'annach region was selected as a case study. Regional planners in the

fifties created its physical form with the objective of fostering maximum co-operation, Arbel [1]. The region spreads over 6,000 hectares of land and is settled by 4,050 persons. The region was planned, and its development implemented, by the Settlement Authority. Its economy is largely based on agriculture, including dairy and poultry farms and various types of cash and industrial crops. The planners prepared a plan that would support modern farming, based on a high degree of co-operation in the production, management and organization of economic activities and at the same time would provide a high level of public services and a rich and stable village community life.

The plan for the region's physical layout was based on a hierarchy of service delivery systems which was designed to maximize co-operation by providing a high level of accessibility to communal facilities, Yalan [19] (Figure 1). The plan consisted of one regional service center (3) and three subregional centers (2). Around each subregional center there was a cluster consisting of at least three villages. Each of the 11 villages also had its own center (1). In the village center the plan provided services for mother and child and for the elderly. The subregional center was intended to provide services for the 180 households of the cluster of villages, and included educational, production, and administrative services. The regional center was planned to serve all the population in the region and to include high school, major cultural and sports facilities and storage and processing plants.

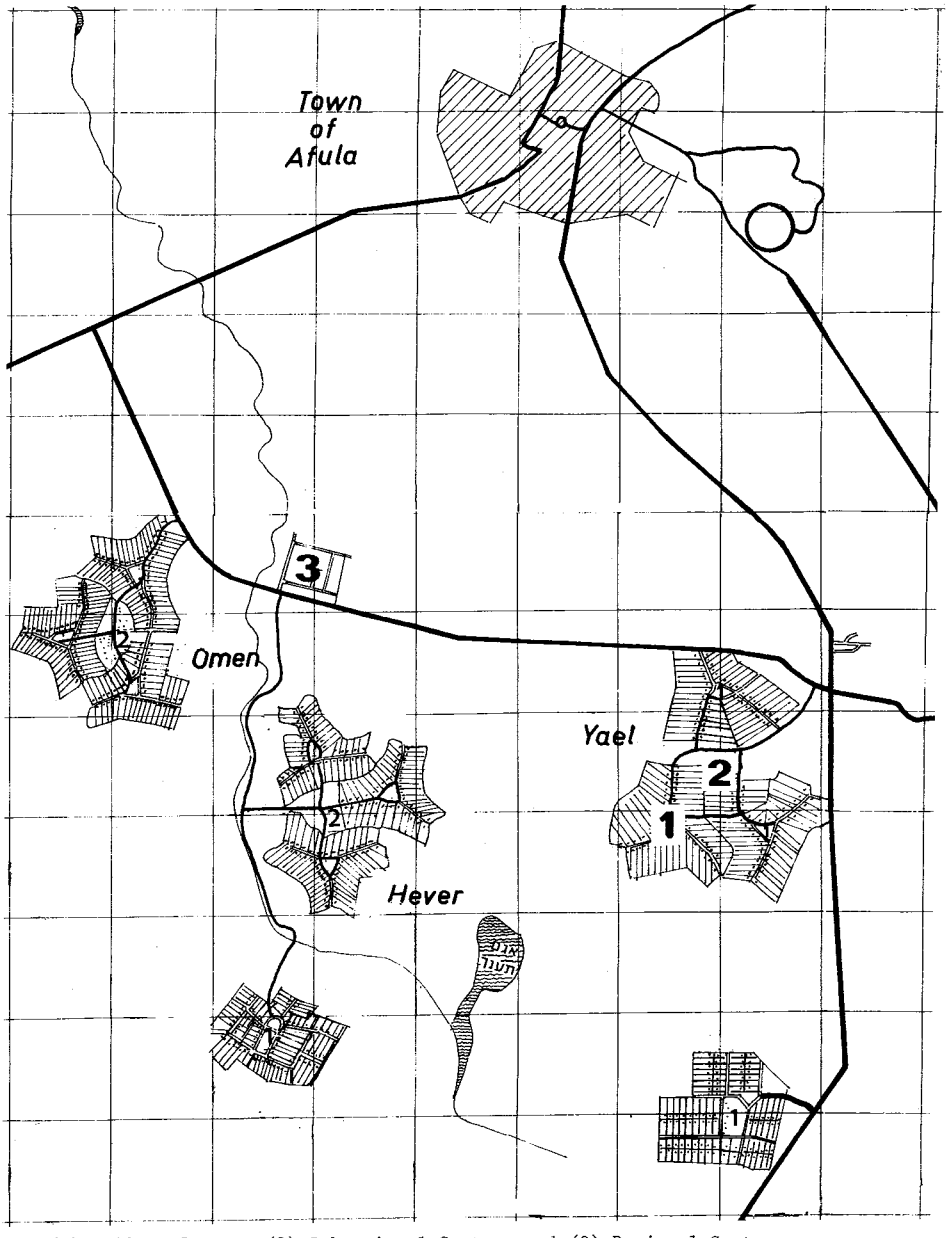
Twenty years later, in spite of careful planning, the region displays a low degree of co-operation.[1] Reality has shown a gap between the planner's desire to foster co-operation and the failure of co-operation to materialize in the region. Presently there is a tendency among the villages to duplicate rather than co-operate on services. Service centers do not function as proposed in the plan. Some have failed to survive because people tend to patronize services out of the region. The number of activities in which villages co-operate has dropped and consequently the general level of service use, particularly of the socio-cultural type, has also dropped. This has resulted in reduced economies of production and a decline in farmer efficiency and income. These developments have cast a shadow on the region's ability to compete economically and to insure population stability.

Issues and Methods of Research

Issues. The research is concerned with two issues: spatial-functional layout and regional co-operation. Operationally we measured spatial organization as the distance between the farmer and the communal service. Three kinds of distances were identified; those of the village level (400 m.) which constitute the

[1] A low degree of co-operation was determined by documentation, observation, and by the comparison of the number of particular types of facilities needed in the region (as determined by the size of the region's population) with the actual number of such facilities existing in the region. In the case of duplication of facilities, or where there are a large number of under-utilized facilities, it has been concluded that there is a low degree of regional co-operation.

FIGURE 1: Ta'annach Region



(1) Village Center; (2) Subregional Center; and (3) Regional Center

average distance between the farmer's house and the center of the village; those of the subregional level (700 m.) which constitute the average distance between the village and the subregional center; and those of the regional level (6,000-7,000 m.) which constitute the average distance between the village and the regional center (Figure 1). The degree to which regional co-operation existed was measured by the frequency with which the services were used, and the farmer's willingness to use the communal services that constitute the substance of regional co-operation.

In a sense we have asked whether the farmer's use of a co-operative service could be attributed to the distance which the farmer lived from that particular service.[2] In asking this question there were several subjects that we wanted to study closely: (a) the degree to which distance contributes to the use, or non-use, of existing service facilities - both those that are functioning and those that are not functioning due to non-use; (b) the proper location for future communal services which are to be planned; (c) the level of the user's willingness to trade off distance for cost and/or quality of communal services, since the same types of services could be provided for different cost levels to the user and of different quality.

Knowing more about these subjects, we hope, will contribute empirically to our understanding of regional co-operation and will have practical application for the planner. It will enable him to make locational decisions with regard to distance, grouping, cost and quality of services, and consequently provide principles for the development of a program for regional physical layout. For the particular region under study, the findings explain the degree to which the failure of co-operation could be attributed to the region's physical characteristics.

The Questionnaire. Based on the structure of settlements in the region we have identified five potential destinations from the households. The following locations represented potential places for co-operative services in the region as a whole; the village center, the subregional center, the subregional center of other subregions, the regional center, and any locations outside the region. Based on the existing co-operative services in the region, and on other services that were either planned or proposed as part of the co-operation scheme, we have produced 14 types of services or facilities as listed in Table 1. These were considered the most representative measurement of the existence of rural regional co-operation in the context of the Ta'annach region.

Each service in the questionnaire was defined by the same three criteria: (a) distance as defined by one of the five destinations; (b) level of quality of services at each location as was defined by the availability of services, and quality and variety of goods and facilities; and (c) price level of each service

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[2]Since in this study distance was investigated rather than other factors, the results could only indicate the potential impact of proximity as one factor, yet not the only factor, that affects co-operation. This addition of knowledge to other studies on co-operation should provide better understanding of regional co-operation.

TABLE 1: Ta'annach Region--Findings in Percentages

Level / Service	Local Center	Sub-Regional Center	Other Sub-Regional Center	Regional Center	Other Place	No Answer	Total
Market	70.9	22.8		4.5	0.9	0.9	100%
Professional Shops	9	47.4	0.9	28.2	12.7	1.8	100%
Community Center	50	32.7		17.3			100%
Swimming Pool	26.4	48.2	0.9	20.9	1.8	1.8	100%
Youth Center	27.3	45.5	2.7	22.7	0.9	0.9	100%
Sports Field	46.4	20.9	1.8	29.1	0.9	0.9	100%
Truck Scales	6.4	30	6.4	50	4.5	2.7	100%
Gas Station	39.1	27.3	0.9	31.8	0.9		100%
Materials and Supply Warehouse	53.6	30.9		13.7	0.9	0.9	100%
Sorting Shed	26.4	33.7	3.6	30.9	2.7	2.7	100%
Flower Processing	21.8	27.3	1.8	41.8	1.8	5.5	100%
Animal Fodder Center	40	42.8	0.9	4.6	2.7	9	100%
Dairy	20.9	59.1	3.6	2.7	2.7	11	100%
Equipment Pool	55.5	40	2.7			1.8	100%

at each of the five locations. The latter two criteria were used in the questionnaire to offer a more realistic choice to the household being questioned. Based on observations of the performance of existing services at the various levels, both in this and in similar regions, price and quality were found to be important factors in the provision of communal services.[3] Having to make this trade off avoided the possibility that the household would choose to have all services in its village center without having to pay the extra cost that it would entail.[4] Figure 2 is an example of the questionnaire for a food market.

The Sample. There are 610 family farms in the region. In order to provide a sample that takes into consideration the physical layout of the 11 villages, as well as the hierarchical structure of the centers, a sample of 110 family units - which constituted more than 18 percent of the population - was selected, Maisel [9]. The size of the sample required the sampling of ten farms in each village and at least three farms selected at random in each of the "arms" of the villages (Figure 1). Special effort was taken to achieve a sample that was distributed evenly throughout the region. The interviews were carried out by qualified persons who read the question to the farmer and filled in his answer.

Analysis of Findings

The data were aggregated for each village, subregion (3-4 villages), and for the region as a whole. Since there were separate figures for each of the 14 different services in the 110 questionnaires answered, there were 1,540 different answers.[5] Table 1 is an aggregation of the findings for the whole sample. Figures in the table indicate the percentage of farmers preferring the location (distance) of the given service at one of the five potential locations they were asked to answer. To find the settler's preference, the data were analyzed to identify the degree to which settlers chose one of the following three potential types of locational combinations for housing the service located:

"A" location of the service only in the village center or only in the subregional center or only in the regional center.

"B" location of the service only in the village and subregional center, only in regional and subregional centers, only in village and regional centers

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[3]Descriptions of cost and quality of services at each level in the questionnaire were based on consultation with experienced regional service planners and economists working in similar rural regions.

[4]Such preferential behavior was also demonstrated in other regions in Israel when cost to individual settlers was not introduced as a factor.

[5]To learn more about farmers' preferences we also asked them to indicate their second choice for the location of a given service. There was, however, not a sufficient number of second preference answers, and they were dropped from the analysis.

FIGURE 2: Example of Questionnaire

Service \ Location		In Your Village (name).....	In Your Subregion (name).....	In a Center for All the Region		Other Location (name).....
				Other Subregion (name).....	Regional Center	
MARKET	quality	basic dry goods only	basic dry goods, meats, fish and fresh vegs.	basic dry goods, meats, fish, veg., clothing, hardware and home supplies		
	price	prices are higher in 15-25% than in sub-regional center	prices are higher in 5-10% than in regional center	prices are 5-10% lower than in subregional center		
indicate your preference for the location of a market		?	?	?	?	?

"C" location of the service in the village, subregional and in the regional centers.

The data were tested for their statistical significance. In the test we were able to learn whether the settlers had a clear locational preference in all levels as in possibility "A", partial preference as in possibility "B", or no clear preference as in possibility "C". A statistical significance level of 5 percent was used first to screen the cases with clear preference (possibility "A") and 13.5 percent for establishing preferences in cases involving two and more locations (possibilities "B" and "C"), Larson [8], Hodges and Lehman [5, p. 416]. When the differences between the two highest results were smaller than 13.5 percent such values were put through a T test in order to establish significance. Figure 3 displays the choices made by the settlers for the location of 14 services.[6] The figures are grouped according to the three subregions and to the region as a whole (11 villages). "Ⓝ" signifies clear preference location in all places, "N" signifies preferred location but not in all the subregions, and "+" signifies no preferred location.

Table 2 is an aggregation of the findings in Figure 3 according to the three possibilities. It demonstrates that most of the significant answers (42 out of 56) indicate a preference for possibility "A", where service location is preferred only in either one of the three potential centers. This preference, which amounts to 75 percent of the sample, represents the regional population's unwillingness to travel certain distances to receive certain services.

Table 3 presents the distribution of the 75 percent cases of possibility "A". The figures demonstrate a clear preference of 85.7 percent (47.6 percent + 38.1 percent) for the location of services in the village or in the subregional centers rather than in the regional center (14.3 percent of the cases). In distance, this indicates that the region's population prefers 400-750 meters as the average travel distance in order to receive a given service rather than 6.5 or 13 km which are the distances to the regional center or to the nearest town, respectively.

Conclusions

The conclusions which are based on the data presented above and on findings on preference of individual villages (not included here for lack of space) provide us with a basis for conclusions on the major research issues.

Use vs. Distance. For services in use in the region at present, it is the distance from the location of the service to the settler's house that determined the degree to which the service was used. Settlers co-operated more intensively in presently active services (markets, community centers, sports field) because they were close to their houses and usually on the village level. There was

[6] In the significance test, preference was shown only for the village, subregional and regional centers. Data for "other subregional center" and "other place" did not pass the significance level and were dropped.

FIGURE 3: Services Location Preference in Ta'annach Region

Level / Service	Ta'annach Region			Yael Group			Hever Group			Omen Group		
	Regional Center	Sub-Regional Center	Local Center	Regional Center	Sub-Regional Center	Local Center	Regional Center	Sub-Regional Center	Local Center	Regional Center	Sub-Regional Center	Local Center
Market			Ⓝ			Ⓝ			Ⓝ			Ⓝ
Professional Shops		Ⓝ			Ⓝ			Ⓝ			Ⓝ	
Community Center			N		+	+			N			N
Swimming Pool		N			N		+	+	+		N	
Youth Center		Ⓝ			Ⓝ			Ⓝ			Ⓝ	
Sports Field			N			N	+		+	+		+
Truck Scales	N				N		N			N		
Gas Station	+		+			N	+		+	+	+	
Materials and Supply Warehouse			N			N			N		N	
Sorting Shed	+	+	+		N		+	+	+	+	+	
Flower Processing	N				N		N			N		
Animal Fodder Center		+	+		+	+		+	+		N	
Dairy		Ⓝ			Ⓝ			Ⓝ			Ⓝ	
Equipment Pool			N			N			N		+	+
Total-N+Ⓝ	2	4	5		7	5	2	3	4	2	6	2

Ⓝ - clear preference in all levels N - clear preference + no clear preference

TABLE 2: Distribution of Preferred Locations According to Three Possible Locations

Level \ No. of Cases		Possibility "A"	Possibility "B"	Possibility "C"
Omen Subregion		10	4	-
Hever Subregion		9	3	2
Yael Subregion		12	2	-
The Region as a Whole		11	2	1
Total	56	42	11	3
Total in %	100	75	19.6	5.4

TABLE 3: Distribution of Possibility "A"

No. of cases / Level	Village Level (400 mt.)	Subregional Level (750 mt.)	Regional Level (6500 mt.)	Total
Omen Subregion	2	6	2	10
Hever Subregion	4	3	2	9
Yael Subregion	5	7	-	12
The Region	5	4	2	11
Total	16	20	6	42
Total in %	38.1	47.6	14.3	100

no evidence in the findings to indicate that a nearer location was preferred or that there was a willingness to pay more for services that are needed more often or used by all members of the family. The lack of such a trend in the data is well displayed by the settlers' willingness to pay more for nearer locations of services like markets and community centers which are needed more often and by all members of the family as well as for nearer locations of supply warehouses and equipment pools which are rarely needed and only by the head of the household.

Failure Due to Location. The failure of some services in the past can be attributed to the unwillingness of the population to use them. This unwillingness to co-operate stems in part from the facilities' poor locations. For some services, settlers' answers show a wide gap between their preference for the services location and the actual location of the failing service. This gap implies some relationship to location. In other services, however, location does not explain their non-use, which should therefore be attributed to other factors (Table 4).

Willingness to Pay for Shorter Distance. Since the preferred locations of 86 percent of the cases were in the village and subregional centers, which are generally more expensive, this implies that for all services that are cheaper in the subregion and regional center location, yet which the settlers preferred to have in their village (i.e., market, community center, supply warehouse and equipment pool), there was a willingness to pay 25-30 percent more for proximity to these services.

Limited Willingness to Travel for Better Quality Services. The 86 percent cases of clear preference for village or subregional centers indicates this to be the maximum distance for which settlers are willing to travel for better quality services. There is willingness to travel to the subregional center for a better youth center, swimming pool, and a dairy and to the regional center for better truck scales, packing and cold storage.

The Gap Existing Between Original Regional Plans and Population Preferences. Table 4 indicates a marked difference between the locations chosen for the services by the planners, the de facto location of services in the region, and the preferred locations as were found in the questionnaire. This table also shows the potential grouping of services in each of the three types of centers, Village Center (VC), Subregional Center (SRC), and Regional Center (RC), and provides an indication as to the location of future services which have not yet been introduced to the region.

Implication for Regional Planning and Development Policy

Failure of Plans and Not of People. Much of the earlier research into the cause for the lack of co-operation in the region looked for inadequacies in the population. Very little attention was given to the inadequacies of the plan which the findings presented here tend to indicate. This case has demonstrated the often incorrect assumption that people should adapt to plans and not vice versa. The findings also indicate that regional planners need to develop the ability to read the changes made in the plan by the settlers not as problems

TABLE 4: A Comparison Between Planning, Reality and Population Preference of Regional Service Location

Service \ Location	Location According to Original Plans	Existing Situations	Preferred Location According to Survey
Market	SRC	SRC + VC	VC
Community Center	SRC	VC	VC
Sport Fields	SRC	VC	VC
Supply Warehouses	SRC	SRC or VC	VC
Equipment Pool	RC	-	VC
Gas Station	SRC	SRC + VC	VC or RC
Animal Fodder Center	-	-	VC or SRC
Professional Shops	-	SRC*	SRC
Swimming Pool	SRC	-	SRC
Youth Center	VC	-	SRC
Dairy	SRC	SRC	SRC
Produce Grading Plant	SRC	SRC*	SRC, RC, or VC
Truck Scales	-	VC	RC
Packing and Storage Plant	-	-	RC

VC - village center SRC - subregional center RC - regional center

- service not in existance * service not in use

in the negative sense but as positive "messages" indicating where the plan failed and needs adjustment. This experience shows again that the best source of information for the planner should be the preference of the population as to the decisions to be made.

More Weight Should be Given to Regional Physical Layout Considerations. The preference among settlers for a shorter distance to services indicates the need to give greater thought to physical-spatial arrangement of a region in the planning stage. In this case we see a need for a partial shift from total reliance of the planner on considerations that intend to achieve economies of scale efficiencies to consideration of the preferences for physical proximity. Physical proximity was shown to have an important impact on the degree of implementability of plans in the achievement of the objectives of regional co-operation. The willingness by the population to trade off services cost and quality for proximity, in a sense, indicated a willingness to subsidize economic inefficiency in the provision of services.

Regional Co-operation Should be Based on Village and Subregional Centers. Future planning to achieve regional co-operation would require change in the physical form of the region. Services will be more decentralized, costlier, duplicated, of smaller size and located nearer to the user. This will imply giving importance to development of village centers and to some degree to subregional centers and less emphasis on the regional center.

Change in Preference Over Time. The recommendations made earlier are based on the study of a region with given population characteristics, layout and stage of development. The degree of applicability of these recommendations to other conditions should be viewed in light of this limitation. For the findings to be more widely applicable there would be a need to study regions in different settings and at different stages of development. Further studies, and their comparative analysis, would tell us the degree to which population preference changes over time. If such a change is proven to be minor, or non-existent, then the data concerning preference could be used to make short as well as long range policy decisions.

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