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Adoption of Innovation and Information Sources in Farming
Business in the Punjab

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During the late sixties the adoption of high-yielding varieties of Wheat and other associated modern farm practices by an overwhelming majority of the Punjab farmers within a short period of three years surpassed all the past records. This phenomenon could hardly be explained by the existing diffusion theories, because adoption process normally involved two or more stages (involving time) in which an individual sought information from multiple sources about the innovation, its suitability to field conditions, cost of the practice and the benefit likely to accrue from its adoption. In the case of Punjab, when the farmers adopted the highyielding variety of wheat and other modern practices, they did not experience the time lags that are normally involved in the various stages of adoption. Also, they did not take too much time in seeking and comparing information from various sources on the characteristics of this technology. This is because the main motive force behind their high adoption rate was significantly higher income potentiality of this technology.

This unique situation can probably be explained by the concept of cultural congruence or the compatibility of the new practice with the past farming practices in vogue in the State, backed up by higher profitability of the innovation. The Punjab farmers were, by and large, accustomed to the use of such indigenous improved wheat varieties as C.273 and C.306 and the

associated practices that went with them. Therefore, when they perceived the possibility of a high return from the new practices, they took it up without needing much convincing from the extension agencies or information media.

During the post-green revolution period, however, the farmers did not restrict themselves to the adoption of high-yielding varieties of wheat and rice. In order to enhance their income, they have also adopted such specialized enterprises as poultry and dairying. It would be of interest at this stage, therefore, to examine the information seeking behaviour of farmers with reference to production methods, marketing and use of financial institutions, and how the size of farm, nature of enterprise and formal education have relevance to accessibility of information sources.

Hypotheses

The central hypothesis of the study is that the cultural congruence (here compatibility) and higher margins of profitability enable a farmer to adopt a new practice without undergoing the usual stages entailing checking and comparing information from various sources. If the profit margins are reduced because of the appearance of new races of pests and diseases. the cost of input assumes greater importance and farmers seek more information from internal and external sources about the cost structure, input-output prices, marketing and finance.

Such hypotheses are:

1. The larger the size of the farm, more diverse are the sources of information sought on production methods, marketing and financial market.

2. More expert oriented the enterprise, more diverse is the source of information - from localite and cosmopolite, from far and near, on production, marketing and financial aspects.

3. Cash crops were more sensitive to market price than the food-grains and hence the farmer required more information on the adoption of the former than that of the latter.

4. The formal education enables a farmer to have an access to more diverse sources of information and also in utilizing the information in production and marketing in a more meaningful manner.

Methodology

To test the above hypotheses, case studies of selected farms in two villages of the Ludhiana District, namely Lal Kalan and Jaipura villages were made. The farmers were interviewed on a structured schedule to collect data on various aspects of agri-business production, marketing and finance - and information behaviour.

Results

Before analysing the case studies of the typical farm situations, it will be appropriate to discuss how cultural congruence played an important role in the large scale adoption of high-yielding varieties of wheat in the Punjab during the late sixties. The Punjab farmers were already used to growing improved local varieties along with complementary inputs. some use of chemical fertilizers and particularly nitrogenous fertilizers was made since 1960-1961. When the HYV came on the scene in 1966-67 and were found significantly more profitable¹ than the local varieties, the farmers adopted the HYV in a

1 Kahlon, A.S. "High-Yielding Varieties Programme in India"
F.A.O. Report, 1975

big way without spending much time and effort in seeking and cross-checking information from various sources. This is because marginal return on investment of time and money involved in the collection of information was quite low.

It was noted that because of much higher profitability of HYVs over the control, in the very first year of the commercial introduction (1967-68), 34.6 per cent of the area came under the HYV, which shot up to 72.5 in 1971-72 and still further to 88.2 per cent in 1974-75.

How the information seeking widens as the enterprise becomes more capital intensive, is indicated by the case study of three typical farm situations in the Punjab. In order to test the hypothesis that the larger the size of farm and higher the education level, greater access the farmers will have to various inputs, marketing and financial institutions, case study of two typical farm situations were made.

Case Studies

(A) A small farmer, aged 50, with no formal education has 1.5 hectares of irrigated land, where he grows mainly wheat in Rabi season and maize in Kharif. Among improved implements, he owns only electric motor and drummy for thrashing of wheat.

After observing the PV-18 and K-227 (HYV) in the field of his friends in the same village during 1967 and 1968, he first used it on a small plot in 1969 and in the following year when he experienced its high productivity, he decided to adopt this wheat variety (K-227) on almost whole of the cultivated land. His information sources for seed and application of associated inputs were limited to only friendly farmers of the village.

He is a late adopter for all the agricultural innovations because even in 1977 he is still using the same variety of wheat (K-227), although other HYVs of wheat such as WG-357, HD-2009 and WL-711 have been adopted by several progressive farmers of his village.

He uses CAN fertilizer only, which he first used on K-227 in 1969/70 and is still not aware of the better response obtained by several farmers by using such fertilizers as NPK and micro-nutrients (zinc).

Again, his source of market information is friendly farmers in the village and 'Kachcha artia' in the local market. He gets the market information about the price of wheat from Kachcha artia through whom he disposes off his produce to the Food Corporation of India. He obtains credit from village co-operative society to buy fertilizers. He has not received any assistance from Small Farmers' Development Agency or taken loan from commercial bank, mainly because of his inaccessibility to these institutions arising from a lack of formal and informal education, lack of outside contact, and the smallness of his enterprise.

(B) The farmer cultivates eight hectares of tubewell irrigated land and owns such improved implements as tractors, electric motor, thresher, seed drill and sprayer. He has a poultry farm of 500 birds. He is 65 years old and is matriculate. Two other family members are middle pass. One of them did young farmers' training course at the Punjab Agricultural University. He regularly reads farm magazines (Changi Kheti) and daily newspaper.

The moment he came to know the potential of the KYVs of wheat seed from the PAU scientists through his son, who had received training as a young farmer in the PAU, he put about one-half of the total area under PV-18 in the very first year of the introduction of HYB (1966-67). In the following year, he put the whole area under the HYV along with the recommend doses of associated inputs. He used CAN, NPX, six irrigations, seed treatment with cerason and weedicide 2-4 D. In 1976, he put the whole cultivated area under the latest HYVs such as WD 357 (from 1974) and WL-711 (from 1976) recommended by the PAU.

Initially, he got the new seed from the PAU at the time of Farmers' Fair which he regularly attends. He uses wider and more credible information sources about the use of various farm inputs, which include radio, university extension agency, and published literature.

At present he uses not only NPK but also micronutrients (zinc). He also applied the latest weedicide (tribunil) to his wheat-crop successfully in 1976, strictly following the instructions of PAU scientists and also the instructions given in the published literature.

In addition to obtaining credit from co-operative society for fertilizer, this farmer also borrowed money from Land Mortgage Bank for electric motor and from commercial bank for poultry production.

He marketed the major part of his produce through Kahccha artia to Food Corporation of India, but also stored large quantities to be disposed off later on, when he could get somewhat higher prices from flour mill owners.

He sold his poultry products to the agents of Dehli firms, who visited his village quite regularly and offered a price higher than that of the local market.

Case studies C and D test the hypotheses that cash crops and particularly export oriented enterprises are more sensitive to market conditions and therefore demand much more information both internal and external before they are adopted.

(C) Wheat and Poultry

This farmer grows not only crops but also does some poultry farming. He is about 52 years old and is middle pass. Among other family members engaged in farming, two are matriculates and one graduate; one of them also received special training in poultry and attended young farmers' training course at the PAU. The family regularly read the Ghangi Kheti+ and daily newspaper. He cultivates seven hectares of tubewell irrigated land and owns such improved implements as tractor, electric motor, diesel engine, thresher, seed drill and hand sprayer.

With the introduction of HYV of wheat (1967-68), he put under P.V.18 about half of his total cultivated land. Because of his son's contact with the Punjab Agricultural University who had received training in the University, he was one of the first in the village to become aware of HYV and procure its seed from the P.A.U. He intended to bring the whole area under the HYV, but because of non-availability of seed, he could not do so. At present, he has put the whole area under HYV (WG 357 for the last three years) and H.D.2009 (from 1976).

+ This magazine on Progressive Farming is issued by the PAU in the regional language

This farmer keeps himself abreast of the latest recommendations of the University through his personal contact as well as through farm literature. The information sources for production methods for him include: farmers, field demonstration, V.L.W., and external sources such as radio, university experts, training camp, university fair and farm literature. This means, formal education of the family enabled them to have recourse to diverse sources of information.

For the last four years he has been using recommended doses of NPK and micro-nutrients, as recommended in the Package Practices developed by the Punjab Agricultural University. He has also been using plant protection measures for the last four years; cerason for seed treatment and Avadex and Tribunil to control wild oats and philaris minor.

When asked, how many irrigations he gave to the wheat crop, the farmer replied that it did not matter, because information on the exact number of irrigations had very little pay off.

Whereas there have been reports of improper application of Tribunil from various parts of the state, this farmer applied Tribunil to his wheat fields successfully. This was made possible because of his contact with university experts and, as he put it, his education enabled him to decode information and better appreciate various elements of the system.

The farmer obtained credit from his village co-operative society for fertilizers, but his electric motor and cattle-shed were financed by the Land Motgage Bank. For poultry enterprise, he obtained a loan from the Punjab National Bank. Thus he used diverse sources of information for obtaining credit for various enterprises.

He started the poultry enterprise five years ago with his own savings on a small scale of 300 ordinary birds. Three years ago, however, he developed contact with a Dehli firm dealing with poultry through its visiting agents, advertisement in newspapers and Punjab Poultry Corporation Handbook and became aware that a new variety of chicks (keystone) was more profitable than the local variety. He immediately purchased 1200 chicks from the Dehli firm.

Whereas in the past he used to prepare the poultry feed himself, now he procures the poultry feed from PPC Store at fixed price. He sold his eggs in the nearest market in the initial stage of the enterprise, but after he expanded it with the improved variety of chicks, he sold his stock of eggs at competitive price to the procuring agents of Dehli company who visited his farm once a week. The chickens are also sold to the same agents instead of selling to local markets and thus he is able to get a higher price than that what he used to get earlier. Whereas in the past he could manage the business from his own savings and from loans from commission agents, for expanding his poultry business he raised a loan of Rs 5,000 from the Punjab National Bank.

(D) Wheat and Potato

This farmer grows not only wheat but also potatoes. Aged 50, he is middle pass. However, two other family members engaged in farming are matriculates, one of which also received special training in agriculture.

He cultivates six hectares of tubewell irrigated land and owns such improved implements as electric motor, thresher and hand sprayer.

At the present state, he is growing the latest varieties of HYV wheat (WG-357 and HD-2009) about which he became aware from radio and he sought information not only from local sources like farmers and Village Level Worker, but also from the university scientists and Changi Kheti and from the I.A.D.P. Package Samachar for the proper application of the associated practices like fertilizers, pesticides and weedicides. He used the latest weedicide on wheat (Tribunil) after ascertaining the proper method of application from the university scientists and agricultural inspectors. He obtained loan for fertilizer from village co-operative society and for electric motor from the Land Mortgage Bank.

After seeing for himself the stand of potato crop in a farmer's field, he discussed the profit potential with him and also with the Village Level Worker and first started growing potatoes on 1/4 hectare in 1970-71. He was, however, disappointed with the unremunerative price offered in the local market. He did not realize that such cash crops as potatoes were more sensitive to market prices and demanded knowledge of potato markets from far and near to be able to decide where to sell. Consequently, he discontinued potato cultivation from the next year. However, in 1974 he read in the newspapers that potato was being exported. He thought it would fetch higher price than before and started potato cultivation again. He contacted the PAU scientists and also read package of practices and decided to obtain Chandramukhi variety of potatoes from the PAU.

He planted it on 1.5 hectares from 1974-75 onwards. Since then, the farmer has maintained regular correspondence with Commission Agents of Dehli and other cities like Jodhpur about the price of potato, when it is harvested.

He sends truck loads of potato either to Dehli or to Jodhpur wherever he finds the price is more remunerative. This is quite in contrast to what he did in 1970-71, i.e., he sold his potato crop only in the local market then.

In case of such export oriented enterprises as potatoes, the farmer seeks information from diverse sources from far and near. The same is true of such specialized enterprises as poultry farming.

These case studies reveal some very interesting conclusions. If a new technology has cultural congruence or compatibility with local technology and has much higher profitability, farmers would adopt it without investing too much of their time and effort in collecting and cross-checking information on it from diverse sources.

A large farmer has greater access to information generated by institutional structure than a small farmer has.

Backed up by formal education, it enables the large farmers to have success to diverse source of information.

Summary

Four typical farm situations were examined as case studies to test the hypothesis that large farmers had greater access to information sources and institutional structure than the small farmers did. Formal education, produced an enabling effect in as much as higher the educational level, greater access the farmers had to the media.

The case studies showed that the larger the size of the farm, more was the information sought on improved methods of production, progressive farm practices and the modern technological inputs. However, the innovative farmers sought this information irrespective of their size of farm.

The studies also showed that farmers made very little investment of time and effort to obtain information on prices of food grains because these were more or less administered prices. They sought more information on cash crops because these were more sensitive to market prices. In case of export oriented crops, farmers sought information from diverse sources, both internal as well as external.

It was also evident that the higher the total volume of business, the more information the farmers sought on institutional sources of credit.

Information concerning an agricultural enterprise

M. Darbonne, Farmer, France

Talking about my enterprise,

- . about its beginning
- . about its development

I feel most capable of discussing this topic.

Our enterprise is a family-enterprise:

- . it was founded in 1885 by my grandfather and was a remarkable one for that time:
40 Ha / 20 workmen
- . the business was then taken over again by my father, after his return from the 1914-18 war; the enterprise remained practically at the same level until 1952.
- . in 1934, being 13 years of age, after attending elementary school, I began to work, at first as an agricultural laborer and afterwards as a foreman.
- . during the war and while my father was in captivity, I together with my mother, took care of the work on our farm.
- . I first took over the business management in 1952, and from only then on, it really started to develop.

AND WHY?... very simply for one reason; because we then began to make use of information.

At the beginning it was information regarding the market possibilities.

Afterwards, it was information about modern inputs, which had been made available to us.

And finally it was also the information about education within the enterprise, e.g. getting the very ordinary people, who were working with us, to understand their tasks better and who - almost without realizing it - were preparing themselves for their role as essential personnel and skilled workers.

/1952/

- 40 Ha cultivated land / 20 workers

1 Principal: Myself

1 Foreman

My wife together with a secretary in the office

1 truck

1 tractor

Since then, every 4 - 5 years a doubling.

. Doubling of turnover (certainly part of this rate of growth corresponded with the general living costs).

. At the same time a doubling of cultivated areas and used material.

/1976/

- 900 Ha in France / 310 employees

1 Principal, still myself

6 supervisors

20 responsible skilled employees

21 employees for administration

10 commercial agents

30 tractors

6 large trucks

- 1 Branch Office in Marocco since 1969 = 200 Ha
150 workmen

- 1 Branch Office in Spain since 1974 = 150 Ha
40 persons

Our production, which today represents nothing more than the development and adjustment of servicing arable land, as was introduced by grandfather and father, can be divided into three groups, of which each one has an equal share of the total turnover:

. PLANTING:

- 80,000,000 strawberry plants
- 13,000,000 asparagus plants
- + several others

. PRODUCTION OF VEGETABLES TO BE SOLD AS DRIED VEGETABLES

- parsley
- chervil
- dragun
- chives
- criss
- porree
- spinach
- + several others

. PRODUCTION OF VEGETABLE BEETS, WHICH ARE BEING SOLD COOKED (pre-packed and half-conserved)

28 % of our turnover in 1976 was obtained through export.

The following is planned for our expansion:

- sale of our vegetables and our spice plants for deep freeze processing
- production of a lawn 'to be rolled off' known as "GAZON-MINUTE"

- introducing new kinds of asparagus and strawberries to the market
- self-service system.

Why did we wait until 1952 before starting with this? I have already mentioned - because of 'information'.

But why was it that 'information' was only available at that time? Very simply because the young future operator, who I was myself, had been awakened by a number of circumstances and became aware of the availability of Information; the future 'boss' then decided to devote part of his time, his nights, and his Sundays in obtaining such 'information'.

This had been offered to me by a group of engineers, who called themselves O.S.T. (scientific organization of labor).

As members of the above, we, the chief clerk of an important industrial organization and myself, founded a two-man working group.

'Once you are really up to date, you won't be able to do without the information you will have at your disposal - and you will ask yourself, how you could possibly have worked without having had information of this kind'.

He was right: this man was, so to speak, the ignition switch, which catapulted our enterprise into an upward trend and only because he taught me the possibilities - and also supplied them - to obtain information and make use of it.

I don't want to waste any time describing the improvements of these circumstances over the years. However, I will show you how the information was obtained and its use in our enterprise since 1977.

The information is divided into several groups:

- . the success of our enterprise
- . monthly balance sheet
- . a critical analysis of each cultivation

THE RESEARCH:

- . new plants and new kinds
- . new material and new products
- . new techniques

THE SELECTION OF:

- . markets
- . consumer requirements
- . existing deficiencies

INFORMATION:

- . from our customers: to find out their requirements and to explain to them, what we could produce.

CURRENT INFORMATION: within the business between key employees, on one side, and commercial agents, skilled employees, members of the workers council, up to the laborers, on the other.

MONTHLY INFORMATION ABOUT:

- . turnover and quantities sold
- . purchase and selling price
- . quantities produced + reserves

BI-MONTHLY INFORMATION ABOUT:

- . the total performance of the enterprise

to be presented one month following the last day of the respective month:

with a complete balance and settling of accounts of farming.
Furthermore the results of analyses of each cultivation.

YEARLY INFORMATION:

. regarding the estimate for the coming year - and thereafter.

Then:

INFORMATION REGARDING PROFESSIONAL TRAINING:

- . training classes - internal and external
- . trips
- . workshops

Let us examine for a change what 'information' means to me, to our enterprise as a whole:

- information can be found in nature, the privilege of a farmer;
it is sufficient to look around.

- the best sources of information for me are:

- . to see
- . to hear
- . to discuss

- the more one travels, the further one goes

- the more one learns:

like:

- . producing cheaper
- . producing better quality
- . producing other products
- . and one learns to discover new markets.

Naturally it is also useful to be a member of an agricultural organization - to visit exhibitions and to attend well-known congresses,

however, nothing is as important, according to my believe, as:

direct contact

making available known techniques

and finally, the consideration of how to arrive at a synthesis.

AN EXAMPLE:

I planted strawberries. We were two important producers in France, together we had over 1.000.000 plants. Now I have learned, that a new method exists in England, which makes it possible to obtain better quality.

- We have got going on the work.

And indeed, it was actually possible to grow really healthy and strong plants, which additionally were free of virus.

We have applied this method and we got an increase in turnover.

Some years later I learn that a new method in the USA makes it possible to grow strawberries throughout the year - (cold-storage-cultivation).

And soon after I began with the tests.

3 years in a row - failures.

I travelled again to the States and it appears that also over there there had been failures at the beginning - however, I was on the right track. And it was really true. My belief in success was now getting firmer.

But the information doesn't end here by any means.

When I tried to get to know something about a certain technique -
the one about expansion - I watched the following:

- new cultivation possibilities
- new kinds,

and I made these observations and information available to my customers.

Our customers tried them, but since the American kinds were more suitable for dryer and warmer regions, we got the idea: to try to offer these kinds around the Mediterranean area.

No sooner said than done! - the customers tried and it worked.
Result: we are now supplying all countries around the Mediterranean.

So we are dealing here with an actual example of information because, while searching for a certain type of information, we returned home with another, which we then used, in the beginning somehow experimentally, however, later on with success.

Still one has to bear in mind, that after information and moral high, a decision must come to final success - then the investment and last but not least much doggedness, endurance, persistence and patience.

But be careful! when the information is available all of a sudden, one must know how to get hold of it. It is important, so to say, to grasp information while passing along, to examine it and then to turn it to advantage.

ANOTHER EXAMPLE:

I returned from my first trip to the United States, having seen farmers working with vegetables on 1000 and 2000 Ha, some 1000 km

from the North to the South of California. This enabled me to examine their farms closely, thereby using the ripening season to the fullest.

Up to this point I was convinced that a farmer is tied to his ground and soil and that he has to adjust his farm to the earth and soil available to him.

Over there I learned the contrary, that it is more advantageous to look for soil that best suits his cultivation.

This information, obtained, slumbered somewhere in my subconscious - and I had thought it was only suitable for Americans.

Some months after my return I enquired about irrigation. The agent told me about good modern set-ups some 600 km south of my farm. Soil which was available for cultivation.

I must again think of the American possibilities of application. Why not 600 km further south? I decided for 'that place'.

Today, 15 years later, I have there: 300 Ha / 100 workers
and that within a distance
of 600 km!

This as an example of apparent information, from which a synthesis can be drawn.

ANOTHER EXAMPLE OF INFORMATION:

We planted medicinal herbs and dried them in the open air. In 1952 I learned that in England one dried hops with warm air. I tried it too and built a drying room.

By means of a drying room with hot air, I considered whether I shouldn't dry vegetables too. I put this idea into practice and produced accordingly.

I obtained advice from producers of dried vegetables, who told me:
= 'very poor quality, you won't be in a position to supply us'.

Nevertheless I gathered more detailed information from them.
They supplied me with samples of their best quality products.
I continued making inquiries with experts. I went to the producers of dried vegetables, who were willing to receive me - in France, in the USA, and I continued my experiments.

A French customer showed real interest in this kind of production, he helped me, I had confidence. We constructed a drying installation, a real one. The customer wasn't sufficiently informed - nor was I: failure.

Then I discovered that an elderly engineer could probably help us sort it out, and he could.

The engineer and I obtained good quality, but we were still lacking the right product technique.

I almost stopped the production, and this so very close to our goal.

Information must be tested before realizing the goal. Afterwards one requires tremendous eagerness and effort to achieve this until one can use the benefits successfully.

One must also sift the information. Sometimes it leads to failure. For example:

- I used to cook beets for salad.
- In 1960 I thought, why not give them away ready cut up and properly prepared?
- I enquired further and found out about conserving techniques.

I started with the experiments and they worked out very well indeed.
I supplied my customers, a very positive echo.

I invested in a machine, a truck and in personnel.
I started properly and the first few days were really tops.
- good technique
- good presentation.

My buyers continued to offer, but the consumer didn't bite, he didn't renew his order.

I organized tests: good and not expensive - they had to work. I held on and so did my buyers. Since the consumer still didn't really catch on, we changed the presentation and the concept. We increased the advertising - nothing happened - the consumer couldn't be convinced. After 5 years and several losses I gave up!

I had wasted my time and I shouldn't have waited 5 long years.

I didn't want to make you believe that an idea can be realized if it originates from information. That isn't enough to make success come along.

I owe it to myself and to you, to also talk about my failures, and I haven't mentioned all of them ...

Anyway, I can put you at ease:

- . grasp the information
- . find it
- . consider for a moment whether it is worthwhile for your enterprise
- . and then put it into practice

all this is breathtaking, magnificent and worthwhile enthusiasm.

It was exactly this which had enabled me for over 42 years to remain in the same business, without noticing that time was passing by.

And apart from that, to have the unique opportunity of finally devoting myself almost entirely to 'information'; as my skilled employees and my sons are here to turn it into practice.

The mixed economy in the kibbutz as its social-economic principle

Dan Shalem, Israeli farmer,

The mixed economy in the kibbutz in Israel represents a special and unique management form which is essentially different from all known forms of mixed economy.

There are more than 240 kibbutzim spread all over the country, producing approx. 40% of Israel's agricultural output. The climate, soil conditions and the general conditions of agricultural production are very varied, but the sole economic form is the mixed economy.

To illustrate this point, I should like to take my kibbutz as an example. My kibbutz, called "Maabarot", is in the area bordering the coast. We have approx. 300 hectares of land at our disposal which is farmed intensively, using the appropriate quantities of water. In other parts of the country there are kibbutzim with approx. 1,000-2,000 hectares of land which are worked more extensively with correspondingly smaller quantities of water. In general, there is a more or less steady relationship between the soil and the quantity of water. Additional areas of land or quantities of water are not available and so these are very limited capital goods. The aim of any agricultural activity is to maximize these capital goods.

Our work force is also limited, but that is only for the time being. At present, my kibbutz pays for 370 members, or as we say 185 economic units. This kibbutz has been in existence for more than 40 years now and at that time was planned for 120 units.

The principle of the mixed economy in the kibbutz not only takes

account of conventional, economic points of view, such as the distribution of risks relating to natural and market damage or optimum utilization of factors in agricultural production. It also takes into account the social principles of the kibbutz community which aims at providing its members with a large variety of suitable jobs.

Therefore, it is possible to see the mixed economy in the kibbutz as a social-economic principle which has developed out of the special style of life in the kibbutz community.

At the moment, we run 8 agricultural branches of production which, depending on the size, employ between 1 and 10 permanent workers. The economic branches normally have a basic minimum staff of 3 permanent workers. This makes it possible to exchange workers in branch management and to leave staff free to carry out specialized studies or to take over public duties in the kibbutz society. The number of production branches is flexible. Seen in the context of general aims, the flexibility of the kibbutz economy is relatively large. Over the years, we have also run other branches of production, such as vegetables and wheat growing, chicken rearing, sheep and goose rearing, wine-growing and banana plantations.

Through the years the composition of the whole economic complex and the number of production branches have changed, but the mixed economy has remained unchanged as the principle.

There are profit-making branches, such as, nowadays, the cotton and avocado plantations, which are favoured by the current economic situation, and there are other branches, such as cattle rearing and fish ponds, which even produced losses last year. The mixed economy can bear such temporary losses - The branches are set up and the balance sheet drawn up with a view to the long term.

We support experiments, such as planting various types of pineapples or avocados. On the one hand, this corresponds to the individual aspirations, scholarliness and specialized interests of the members.

However, it also leads, in many cases, to pioniering progress and positive economic results.

The essential basis of the kibbutz economy is the agricultural sector. However, as it is unable, despite its diversity, to offer sufficient work and employment possibilities, agriculture has become over the years really only a branch of the kibbutz mixed economy.

The other branch which is continually developing is industry and in many kibbutzim industry has not just been limited to one firm.

In a certain sense, the economy conforms to the society. Approx. 60-70% of the second and third generation stay in the kibbutz. Moreover, we strive to take in new members. This expansion of society forces us to extend the work possibilities.

After agriculture, despite its continuous upward trend, had reached the limit of its employment possibilities, it was really only a step towards industrial development and the extension of external work.

It is worth noting that, in many cases, these so-called non-agricultural branches of employment also have a certain importance for agriculture, e.g. in the case of the sectors of industry which produce for agriculture, employment in the regional workshops, which process agricultural products such as cotton and fruits and also the production of concentrated feed. Even external work is partly connected with agriculture, e.g. officials or special advisors in the Ministry of Agriculture.

Therefore, the mixed economy in the kibbutz is a mixture of agriculture and industry, with their organisation, economy and finances being managed and run together.

The components of this economy are i.a.:

- 1) Individual labour to the exclusion of wage labour.
- 2) Developed modern technology.

- 3) A general high level of education with continuous specialized training.
- 4) A modern planned economy.
- 5) A democratic economic management system.
- 6) A regional and central organisation with a developed information and advisory service.

The choice of which branch, the number and size of the various economic branches - these are all questions for farm management decision. Therefore, when I describe a kibbutz mixed economy to you, you know that this has grown up systematically and is continuing to develop on definite economic and social foundations.

Cows with an annual milk yield of more than 8,000kg (not to mention the milk yield of first-class herds which produce more than 10,000kg), cotton plantations with more than 5 tonnes of raw cotton per hectare or top quality avocado plantations with approx. 15 tonnes per hectare - in other words, such agricultural achievements as these and let's not forget modern, mechanised and export-orientated industry. All these results can only be achieved in an economy with a GNP of approx. 5 million pounds as a result of and with the aid of modern productivity, highly skilled workers and the maximum utilisation of information.

Let us look at the example of the computer as the symbol of modern technology and productivity. About 15 years ago we had already started to maximize our agricultural and economic programmes with the aid of linear programming and nowadays most of our farms work with central or regional computer plans.

Economic management or the economic management system is democratic. We have virtually no manager in the whole economy or in individual branches who holds his post for longer than 3-4 years (and that is a long time). That is a part of our special social structure. The managers of the economy are changed every 3 years and are re-elected. This rotation within management is only possible if we have sufficient

expert and organisational workers at our disposal. Of course, that is connected to the general level of education.

Specialized training is an integral part of our work programme (approx. 5-6% of our available work force) and consists of short monthly courses up to degree level at a technical university. Today there are approx. 20 members on our kibbutz who have studied management and economics.

This general high level of education in management and also in the branches of the economy contributes a lot to the collection of information and to its profitable use. Moreover, it is only through this high level of education that we are able to put into practice the information which we gather - perhaps even in abundance - from different sources. This is the reason why I cannot stress enough the importance and connection between the educational level and the utilization of information.

As has already been mentioned, the sources of information are diverse. Central, regional and State sources, the exchange of expert knowledge at international level, universities and training institutes, economic organisations and cooperative selling associations all contribute to the task of keeping agriculture up to date and enabling it to maintain its leading position in the national economy.

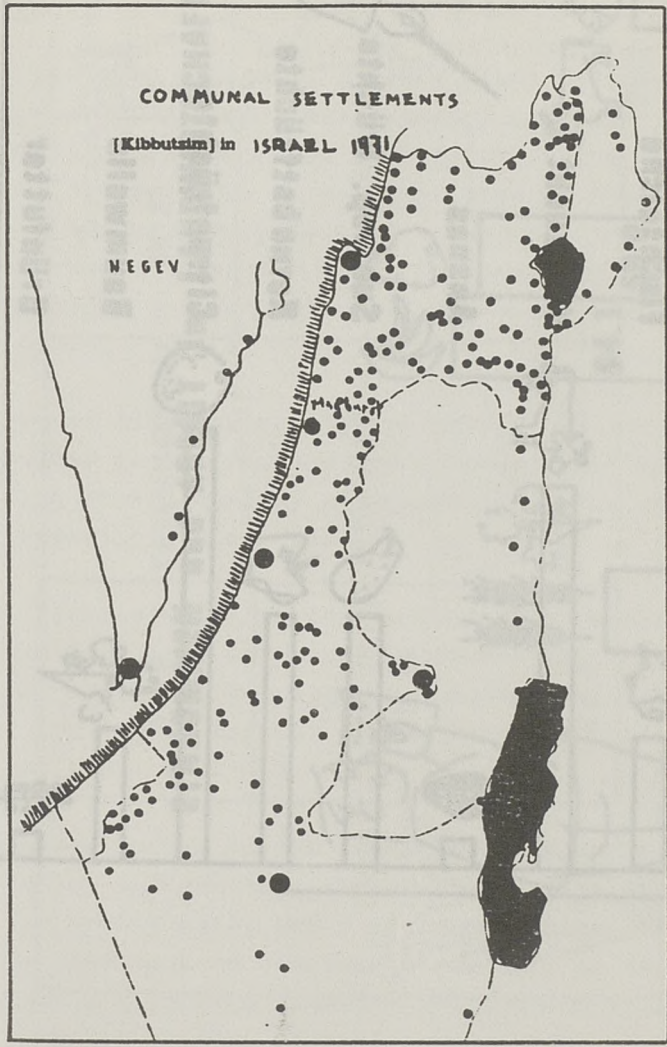
We consider it our job not only to collect and utilize information, but also to actively participate in the continuous development of the sources of information. An example of this activity is the merging of kibbutzim into national organisations with development in all areas of life: economic consultation and financial organisation, culture and education. About 4-5% of our work force is employed in these national organisations.

Regional organisation is also an essential characteristic of our economy. Cotton and pome fruit, milk production or chicken rearing, avocado or bananas are impossible and unthinkable in our economy without this regional guidance, organisation, further processing and marketing of these products.

I have attempted to describe to you in 30 minutes the kibbutz as a mixed economy. This is perhaps an impossible task, but I hope that I have explained that the special nature of this economy arises from our social form.

On the one hand, the mixed economy is the economic basis of the kibbutz community. However, it also serves the latter's social aims and individual expectations.

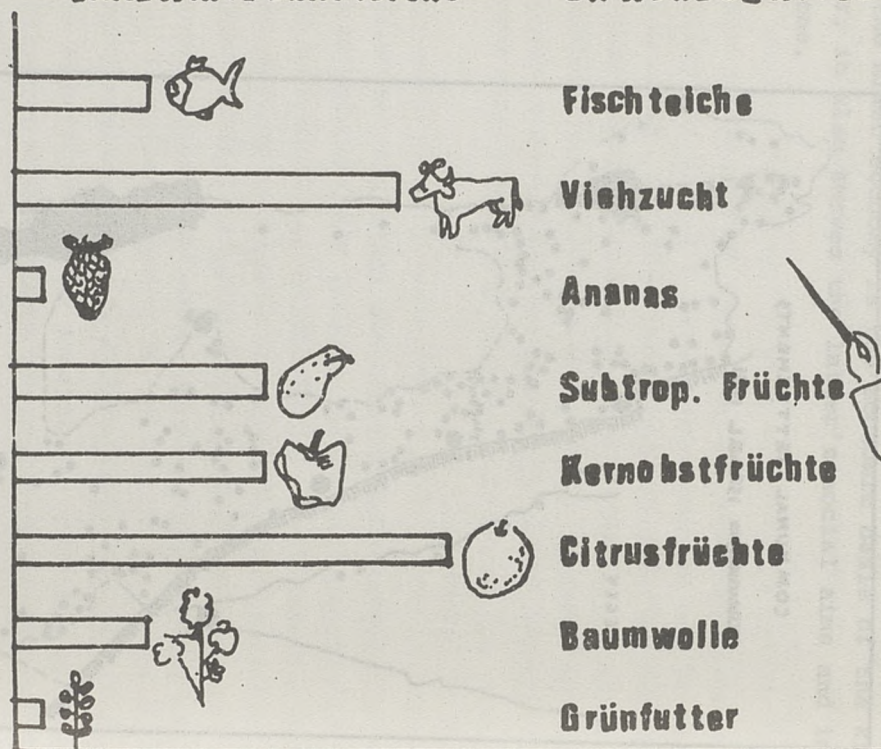
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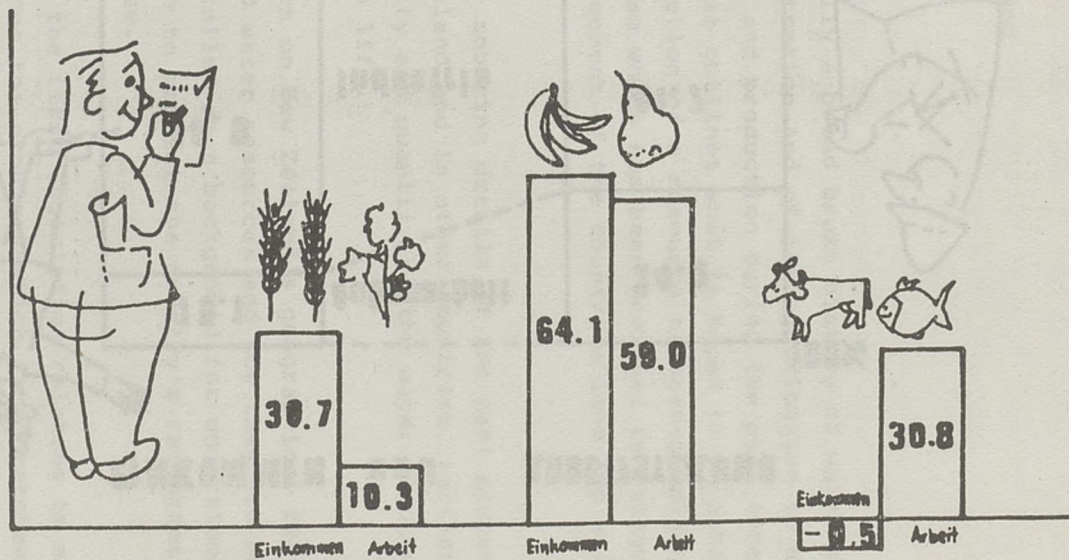
□ = 1 Arbeitsjahr

LANDWIRTSCHAFTLICHE

ERWERBSZWEIGE



EINKOMMEN und ARBEIT in LANDWIRTSCHAFT



EINKOMMEN und ARBEITSTEILUNG

