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**SOCIO-ECONOMIC ANALYSIS AT THE FARMER LEVEL
FOR BETTER FOOD-CROP SYSTEMS, PROGRAMS, AND POLICIES**

by

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INTRODUCTION

This handbook focuses on "bottom up" analysis of ways to improve food-crop production and post-harvest systems. It deals especially with the potentials and problems of small farmers. It emphasizes the need to view programs and policies through the eyes of rural families and other local people. It emphasizes also the need for local people to know about trends and events at national and international levels that may affect them.

The handbook is divided into three sections:

- Part A. Background perspectives
- Part B. Understanding farmers' situations
- Part C. Analyzing possible changes in farmers' food-crop systems
- Part D. Analyzing ways to help farmers make these changes

Each section has some simple methods and concepts that can be helpful when designing food-crop development strategies, programs, and projects. Many of these techniques come from agricultural and regional economics. Others come from agronomy, sociology, communications, and management science. Most of these techniques can be used by persons who are not specialists, or who do not have much time or money for analysis. The contents reflect experience with the 1983-90 USAID Secondary Food Crop Development Project in Indonesia as well as with programs in other countries.

While handbooks like this may be helpful, it should be realized that data, analyses, and plans in themselves will not lead to program success. Several additional ingredients are needed. There has to be REALISM about the capabilities, limitations, and motivations of people. There has to be CREATIVITY in generating fresh ideas that are attuned to the future. There has to be READINESS to try out these new ideas, even though they may bring risk and criticism. And above all, there has to be GENUINE DESIRE to improve human wellbeing and ENERGETIC EFFORT in the translation of plans into action that will help to do this.

- A1. What we mean by small-farm food-crop systems.
- A2. Why food-crop development?
- A3. Broad strategies for stimulating food-crop development.
- A4. Food-crop development as farmers see it.
- A5. Food-crop development as change-agencies see it.
- A6. Some trends that may affect future food-crop development.
- A7. Systematic analysis of local food-crop problems and potentials.

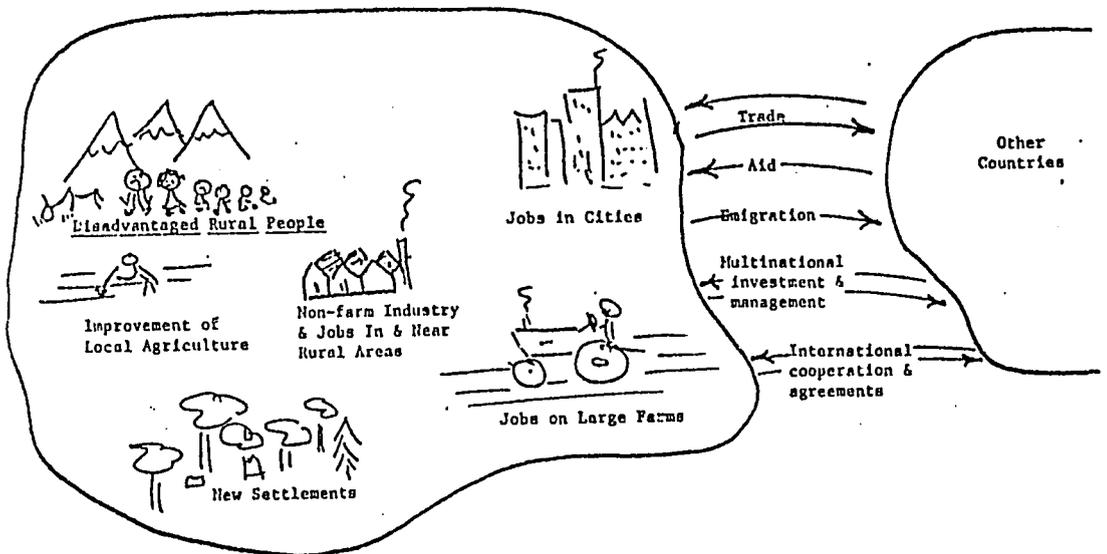
Discussions and analyses of food-crop development often concentrate on a particular aspect. Specialists and administrators tend to regard their own work as more important than the work of others. They may fail to see how their work fits into the broader picture.

For this reason, it is useful to view food-crop development in "systems perspective". Food-crop systems can be shown in several ways. Some people like to use geographic maps or sketches. Others like charts or diagrams that show the interrelationships between one part and another. Still others like mathematical equations as a way to show how things fit together. Some examples are on the pages that follow.

Maybe the next time you are making a presentation or conducting a meeting on food-crop development, you can prepare a sketch or chart of your own that helps to see things in perspective. This can be displayed at the front of the room to help keep the discussion "on track". The way that you do it should be attuned to 1) the topic at hand and 2) the background of the people you are communicating with. Try not to make it more complicated than needbe. It often helps to start with a very simple diagram and then, little by little, add more details the discussion evolves.

A PROVINCE OR NATIONAL FOOD-CROP SETTING IN PERSPECTIVE

Farming areas in a province or nation differ with respect to agronomic potentials, access to markets and non-farm employment, infrastructure, and needs to support low-income families. As the economy develops, urbanization and industrialization take place, and farming areas have closer links with cities, national commerce, and international trade and finance.



RURAL AND URBAN POPULATION SECTORS IN PERSPECTIVE

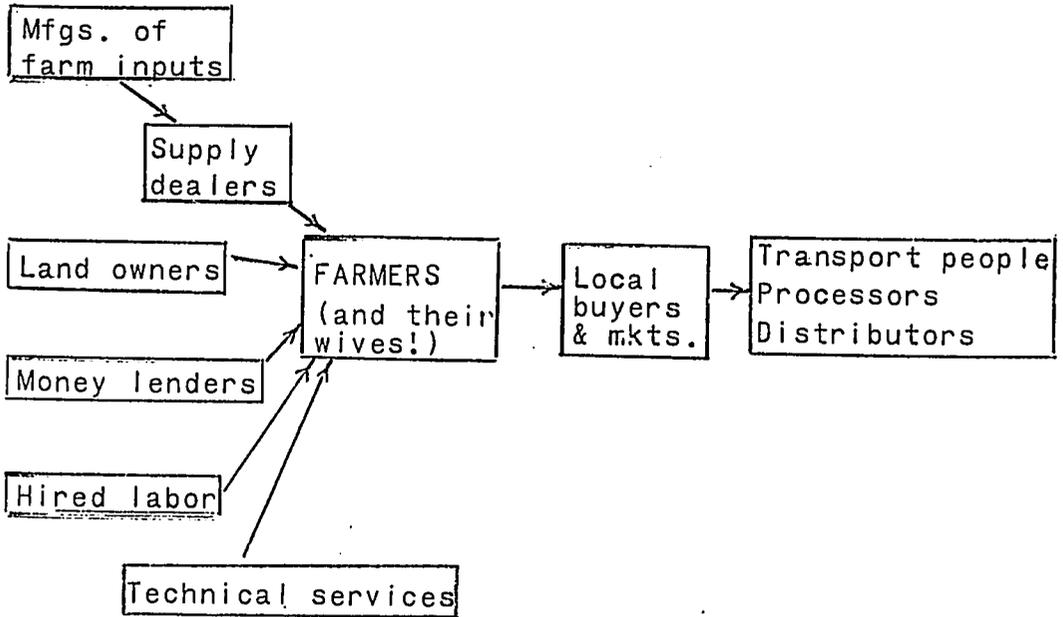
Exhibit 2. Four Pivotal Sectors Found In Many Developing Countries

<p>URBAN MODERN SECTOR</p> <p>Large industry Skilled workers & professionals Specialized services Financial institutions High officials Suburbanites</p>	<p>RURAL MODERN SECTOR</p> <p>Large agricultural producers Efficient small farmers Commercialized marketing, finance, input supply, & trade systems Specialized agr.-services Skilled workers & organized labor Some small and medium scale industry</p>
<p>URBAN SUBSISTENCE SECTOR</p> <p>Immigrants from rural places In urban slums Unemployed workers & rest- less youth without skills Mother & children without husbands or other family members nearby Many in low-paying, undependable jobs</p>	<p>RURAL SUBSISTENCE SECTOR</p> <p>Tradition-oriented, marginal farm families in disadvantaged locations Many tenants & landless workers Absentee landowners Mostly small shops, middlemen, moneylenders, traders Few specialized services; little access to modern technology Small cottage industry, with little market organization</p>

Based on the "modified dualism" model evolved by Professors William E. Cole and Richard S. Sanders of the University of Tennessee, Knoxville.

Question: How well does this describe sector characteristics in Indonesia?

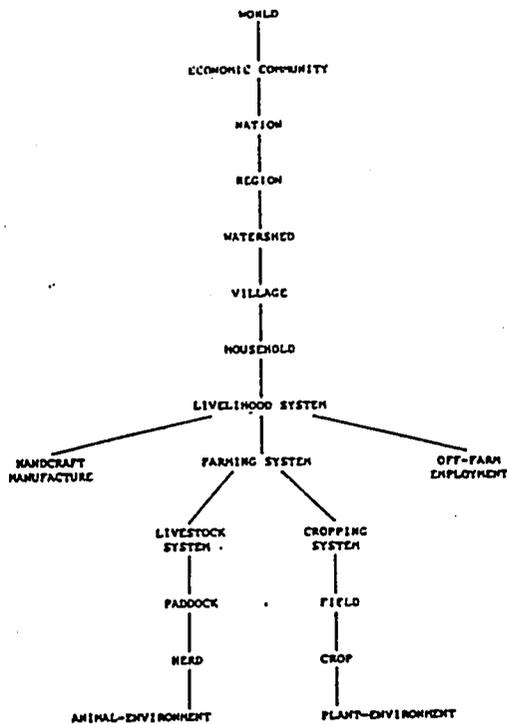
This diagram helps to define the target groups at whom educational and action programs might be directed.



THE VARIOUS LEVELS OF EVENTS AND ACTION
AFFECTING AGRICULTURAL AND RURAL DEVELOPMENT

A1.4

This diagram is relatively easy for non-specialists to understand. It lends itself to discussion of local, regional, national, and international influences on the productivity and wellbeing of people in rural areas.

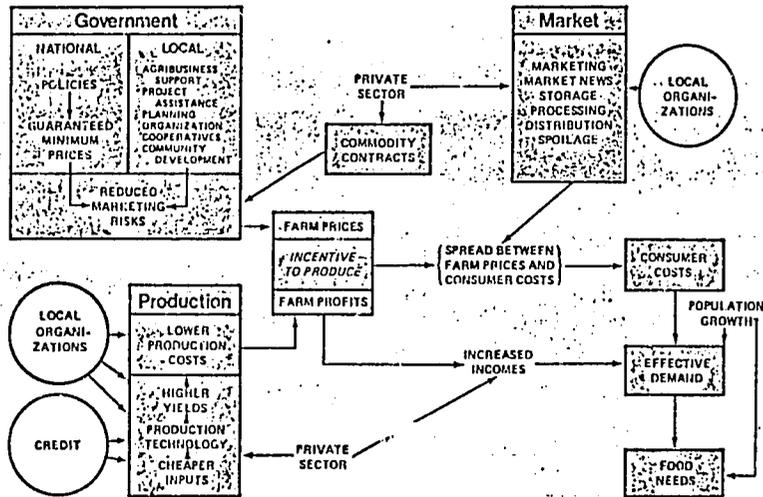


Source: Gordon R. Conway and Jenifer A. McCracken, "Rapid Rural Appraisal and Agroecosystem Analysis", page 2, monograph from International Institute for Environment and Development, London, 1987.

EXAMPLE OF A SYSTEMS DIAGRAM
DEPICTING THE AGRICULTURAL ECONOMY

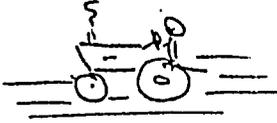
A1.5

The flow chart below shows a chain of supply and demand factors in a low-income agrarian economy. The line of thought is as follows: 1) the population's nutritional needs are often greater than domestic food production; but 2) actual demand for food is often less than this because many families have low incomes; 3) this tends to reduce prices received by farmers and weakens their incentives to produce food; 4) government can help farmers to improve production efficiency so that food supplies increase without raising consumers' costs; 5) it can help also to improve marketing efficiency so that the price spread between farmers and consumers is reduced; 6) attention to price stability will help too; 7) this leads to increased rural incomes and lower consumer food prices and enables more low-income households to meet their food needs. The main point is that balanced attention to all these components is needed if bottlenecks are to be avoided.



Source: Milo L. Cox, "A simplified approach to agricultural systems", IADS Occasional Paper, 1979, 8 pages.

When designing food-crop development policies, programs, and projects, it is important to have clear understanding of the objectives.



Sometimes the emphasis is on gains in productivity and efficiency.



Sometimes the emphasis is on equity -- helping disadvantaged areas or groups to improve their levels of living.



Sometimes the emphasis is on stability -- reducing fluctuations and uncertainties in prices, production, etc.

In Indonesia during the 1960s, 1970s, and early 1980s, the dominant objective was to achieve self-sufficiency in production of rice, the people's most important food source.

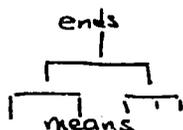
In the mid-1980s, under Repelita IV, increased production and processing of secondary food crops also received attention -- especially corn, soybeans, mungbeans, peanuts, cassava, and sweet potatoes. The aim was to reduce imports and increase exports of these "palawija" commodities.

In the early 1990s, under Repelita V, more attention is being given to goals besides increases in production. These include improvements in small farmers' incomes, rural employment, and long-run sustainability of food-crop systems.

WHAT GOALS (AIMS, OBJECTIVES) SHOULD BE EMPHASIZED
WHEN DESIGNING AND EVALUATING FOOD CROPS PROGRAMS?

One often finds that several goals are important, such as:

- ** More total food crops production
- ** Higher yields per hectare
- ** Diversification; less dependency on a single food crop
- ** More export earnings
- ** Less food imports
- ** Increased farmer incomes (earnings)
- ** Better nutrition for low-income families
- ** More jobs (employment) in low-income rural areas
- ** Soil conservation; less erosion; encouragement of sustainable cropping systems



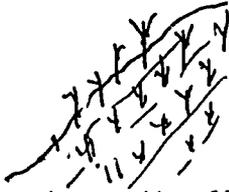
It is important to distinguish between ends (goals) and means (ways to achieve those ends). E.g. (for example), increases in crop yields and production are not social-economic goals in themselves. They are means toward achieving more income, better nutrition, etc. However, higher yields and production are not the only way in which incomes and nutrition can be improved.



Often, there are trade-offs between one goal and another. I.e. (that is), a program that fits one goal best will not be so good from the standpoint of another goal. E.g., if more export earnings in the near future is the main goal, commercial food-crop systems in farming areas that are already developed might be emphasized; however, this may not bring many direct benefits to low-income rural families in remote places.



Goals that are important from the national standpoint (e.g., reducing food imports) may not be the same as those goals that local areas and individual families want most (e.g., cheaper food and more jobs).



Goals that emphasize quick results may not be consistent with long-run success. E.g., in hilly areas, intensive cropping systems may have high returns the first two or three years, but they may lead to soil erosion and reduced yields before long.



Arriving at answers about the food-crops goals to be emphasized entails value judgments -- judgments about goals ^{that are} ~~is~~ important and not important to try to achieve ...judgments about results that would be good and bad. A task of officials and leaders is to arrive at consensus about these goals. Often they are articulated in national plans. A task of professional specialists and planners is to make technical judgments about means -- strategies, programs and priorities -- that would be consistent with these value judgments.

Questions for thought and discussion:

1. If you wanted to find out what are the main goals of Palawija activities in Indonesia, what sources of information would you turn to, or with whom would you talk?
2. From what you now know, what will be the important goals of Palawija programs in the next few years?
3. Are these future goals, and the emphasis placed on each goal, the same as in previous years?
4. Is it possible to fulfill all these goals? Or will greater achievement of one goal have to come at the expense of less emphasis on another goal?
5. What do these future Palawija goals imply about location of future Palawija projects?

Important questions

1. Emphasize a) productivity, b) equity, or c) security?
2. Through government agencies?
3. Subsidies and controls?
4. Quick impacts?
5. Where to implement first?
6. Centralized administration?
7. Inter-agency cooperation?
8. Can use extra funds?
9. Can try new ways to help farmers?
10. Can use inputs and technologies from other countries?
11. Encourage small farms and small businesses?

Factors affecting strategies

Funds	Economies of size
Skills	Ease of changing policies and agencies
Local organizations	Sociological characteristics
Business activities	Political-economic system

Palawija strategies in Indonesia

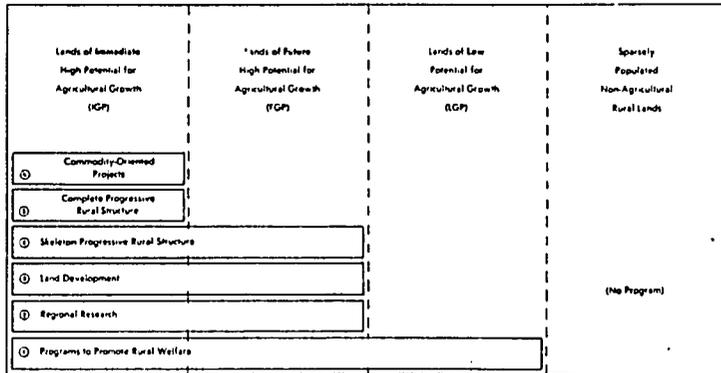
Current emphases: higher yields & more production ...pilot areas ...demonstration farms and areas ...revolving funds ...some input subsidies.

Likely future needs: reach more farmers at less cost ...more involvement of private sector ...help remote areas ...emphasize farming systems ...farmer education about marketing & financial management ...more Palawija crop research under local conditions ...more attention to demand, & post-harvest handling.

**DEVELOPMENT PROGRAMS AND PRIORITIES
SHOULD BE ATTUNED TO AGRICULTURAL GROWTH POTENTIALS**

A3.1

Arthur Mosher, in his book Creating a Progressive Rural Structure to Serve a Modern Agriculture (Agricultural Development Council, 1969) calls attention to distinguish among areas that have 1) immediate high growth potentials, 2) future high potentials, and 3) low potentials but large populations to support:



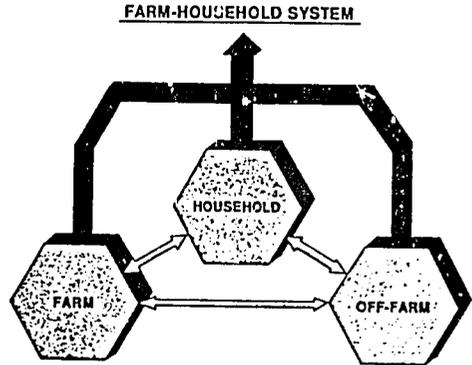
This seems to fit Indonesia quite well. It is similar to the useful distinction that the SFCDP/USAID Director (Dr. Saroso S.) makes among 1) highly productive areas near markets, 2) remote low-potential areas, and 3) in-between areas.

A country that wants to increase food self-sufficiency and/or agricultural exports as quickly as possible will tend to concentrate on areas with immediate high potentials. The focus there can be on efficient food production and marketing systems.

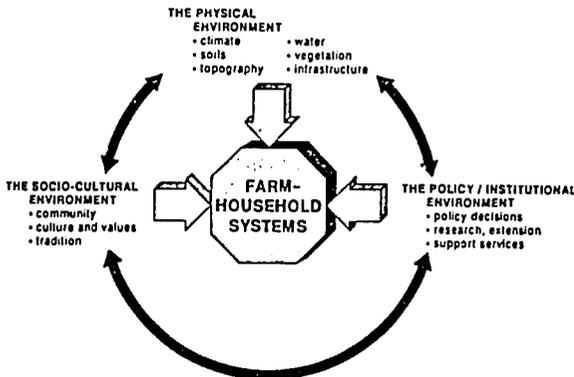
Longer run improvements would include attention to roads, irrigation, agronomic trials, etc. in areas with future high potentials.

Attention to low-income rural areas with low agricultural potentials might emphasize basic human needs, low-risk farming systems, and training for non-farm jobs.

Proposed changes in cropping systems need to be viewed through the eyes of farmers and the members of their households. Their readiness to adopt new systems will be affected by such considerations as family subsistence needs, time and skills available, non-farm earnings possibilities, their financial resources and ability to absorb risks, social obligations, and aspirations for the future.



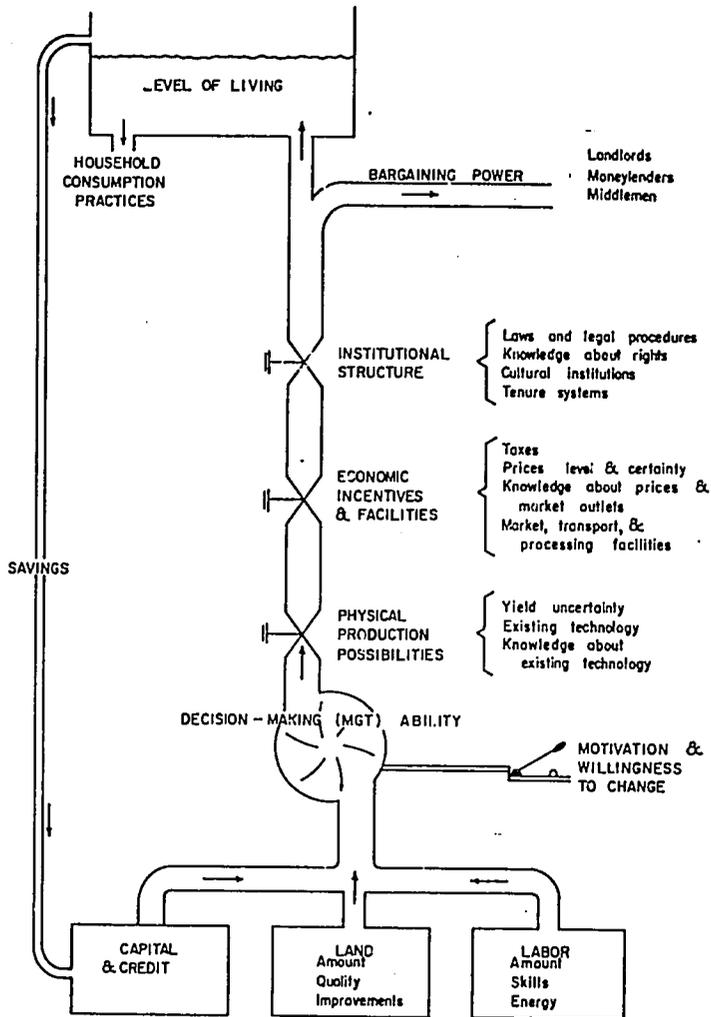
Similarly, the farm household will see itself as surrounded by various external forces that affect its wellbeing. Some of these forces can be changed, but others cannot.



Source: FAO, "Farming Systems Development: Concept, Methods, Applications", 1989, 44 pages.

A NUMBER OF FACTORS
AFFECT THE IMPACTS OF IMPROVED FARMING PRACTICES
ON FAMILY LIVING LEVELS

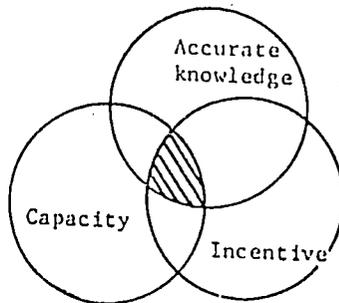
A4.1



Source: David W. Brown, unpublished teaching materials.

Farm families are not likely to make the changes in food-crop systems and practices that are being promoted unless three ingredients are present:

- KNOWLEDGE**.....Awareness of new technologies
 Skills for using these technologies
 Information about the likely results
- CAPACITY**.....Appropriate land and water resources
 Enough savings or credit
 Access to inputs and post-harvest services
- INCENTIVE**.....Expectations of increases in income
 Absence of extreme financial risk
 Compatibility with family subsistence
 Compatibility with community relationships



Farm families do not always have accurate perceptions related to these three ingredients. Rumors, poorly managed demonstrations, false advertising, etc. may give them a distorted picture of the costs and benefits of proposed changes in food-crop systems.

**SOME FARMERS CANNOT YET CONSIDER
SOPHISTICATED TECHNOLOGIES**

A4.3

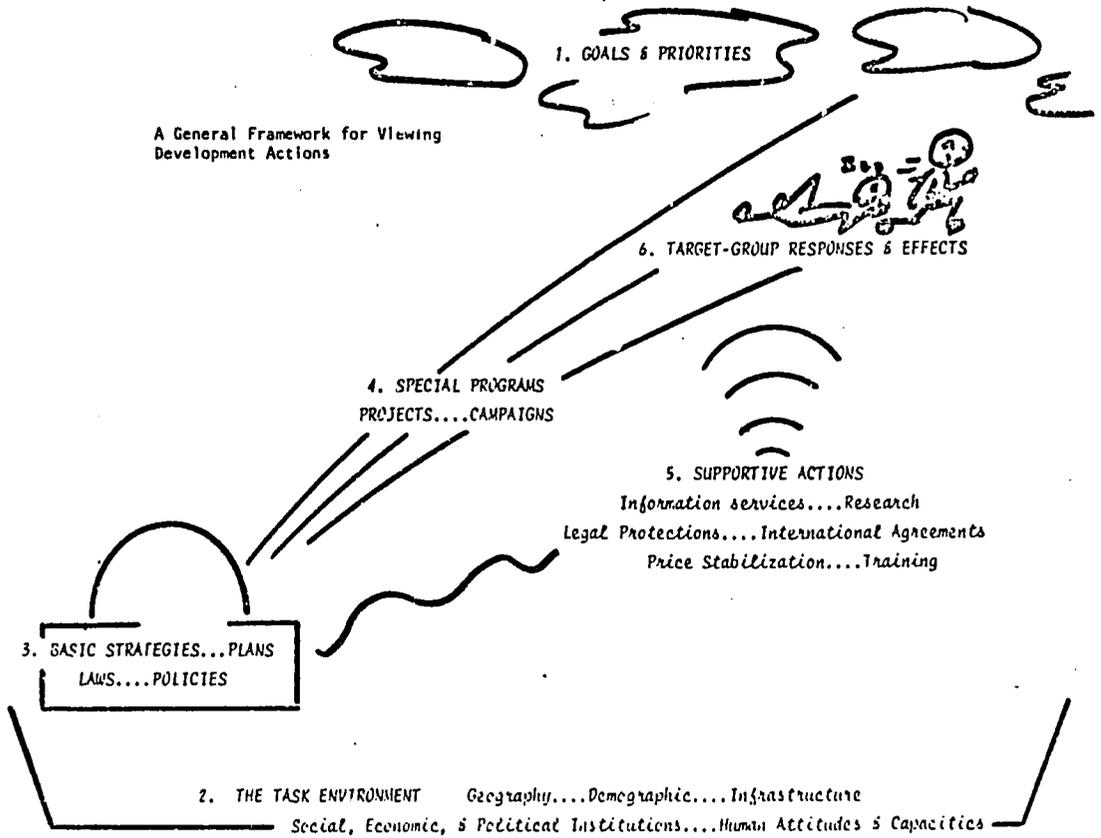
Technology Ladder

Technologies more difficult to implement		Technologies easier to implement
<p>Trees, soil conservation, terraces, wind breaks</p>	<p>monocropping, chemical weed control, new horticultural crops, soil testing, rhizobium</p>	<p>Improved tools (non power), Improved cultivation ie. - row spacing - ridge planting - timing of common practices, - manure fert. placement</p>
	<p>hybrid crops, new crops (not hybrids), mulch, improved pastures</p>	<p>fertilizer, insecticide, fungicide</p>
<p>Difficult for farmers to understand Higher cost of inputs High reliance on commercial systems High change from tradition Higher risk</p>		<p>Improved (open pollinated) varieties</p> <p>Easy to understand Low cost of inputs Low reliance on others Traditional farming Lower risk</p>

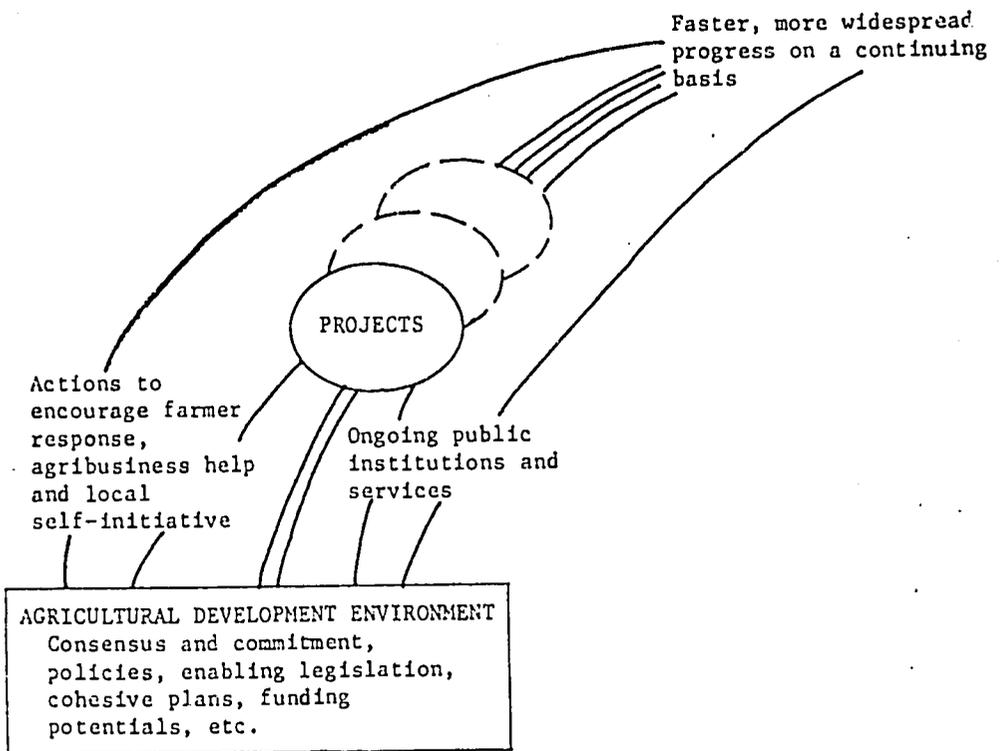
This ladder is an estimate of the degree of difficulty, in implementing certain technologies to Indonesian farmers based on the above criteria.

** Brian Hilton agronomist
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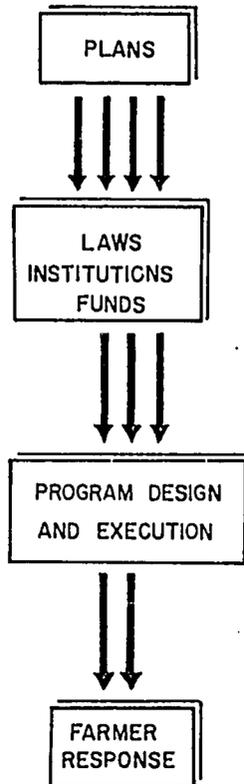
Plans, policies, programs, projects, and targets in themselves achieve nothing. These have to be translated into action that induce the hoped-for response by farmers or other target groups.



Projects are usually short-lived. They are like "rocket boosters" that help to launch and speed up progress toward food-crop development objectives. But projects are not a substitute for the sustained contributions of leaders, government agencies, and private enterprises to improved food-crop systems.



At the various stages of program and project implementation, there are likely to be slippages that lead to delays, limited results, and/or higher costs. These may be caused by many factors, such as poor communication and coordination, bureaucratic "red tape", failure to understand local agricultural situations, uninspiring leadership, lack of resources, and legal obstacles. Ambitious plans and high targets can stimulate greater effort. But at the same time, one should be realistic about slippages when making plans and predicting results.



SOME TRENDS THAT MAY AFFECT
FUTURE FOOD-CROP DEVELOPMENT

A6.1

As nations develop, changes take place that affect food-crop development goals, as well as methods for achieving these goals. Here are some trends in Indonesia that one economist sees as having implications for future food-crop development programs.

1. More concerns about regional growth, jobs, environmental quality, exchange balance.
2. Urbanization & industrialization.
 - ** part-time farming...absentee owners
 - ** more commercial food production & marketing
 - ** new consumer food tastes
 - ** more competition for land, water, labor
3. More influence of national & international supply-&-demand on local commodity prices. Changes & fluctuations in prices.
4. More differences among farmers.
 - ** some commercial...others subsistence-oriented
 - ** various specialties within the same area
5. Limited government & assistance funds for food-crop development...fewer subsidies & special projects.
6. But more local people with good education, some savings, communications, & business inclinations.

Source: David W. Brown, presentation at SFCDP workshop, December 1989.

1. Less emphasis on single crops ...more on farming systems that help foreign exchange, rural incomes, local employment, and regional development.
2. More attention to soil conservation and environmental impacts.
3. Outlook information & farm management education to help farmers be more responsive to price changes.
4. Careful appraisal of program spread-effects & cost-effectiveness...readiness to consider new ways to introduce better practices & systems.
5. Less reliance on subsidized food-crop development projects to get things done...more stimulation of local people, investors, etc. to provide food-crop services.
6. More emphasis on disseminating reliable technical & economic information, & user-friendly advisory services, to reach these groups.
7. Attention also to testing, technical information, & business education that helps small farmers not to be "exploited" as food-crop systems commercialize.

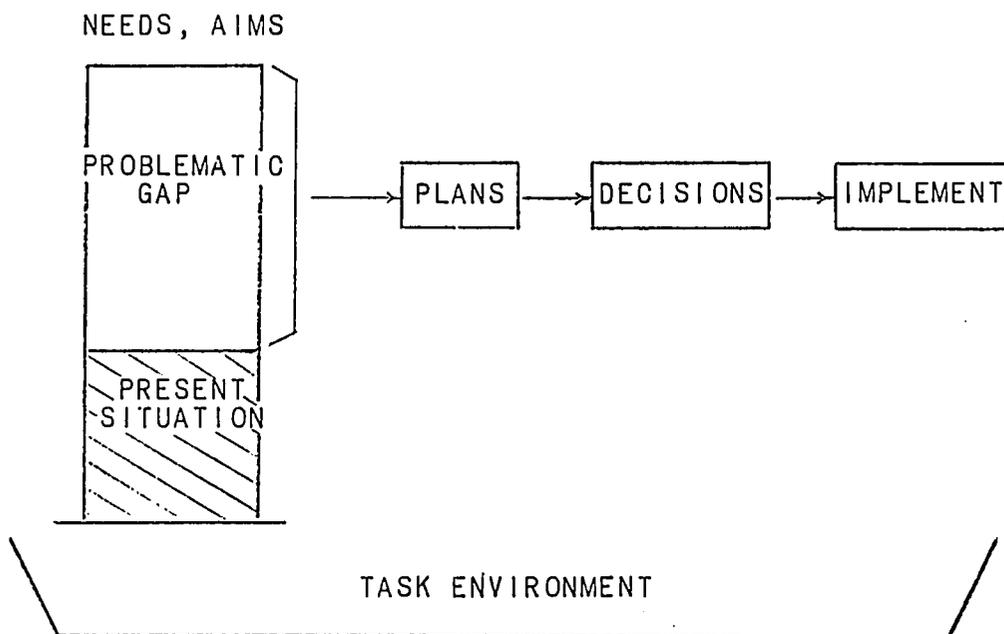
SYSTEMATIC ANALYSIS OF
LOCAL FOOD-CROP PROBLEMS AND POTENTIALS

The changes that are taking place in Indonesia make it important to re-examine food-crop systems, programs, and policies. This is true for high officials, program managers, technical specialists, and extension workers, as well as for farmers, private businessmen, and group leaders.

Not many of us have funds to conduct a special study. But much can be learned from field visits and from use of data already being obtained. This requires keen observation and systematic analysis, using a problem-solving framework.

One such framework is to focus on the following questions:

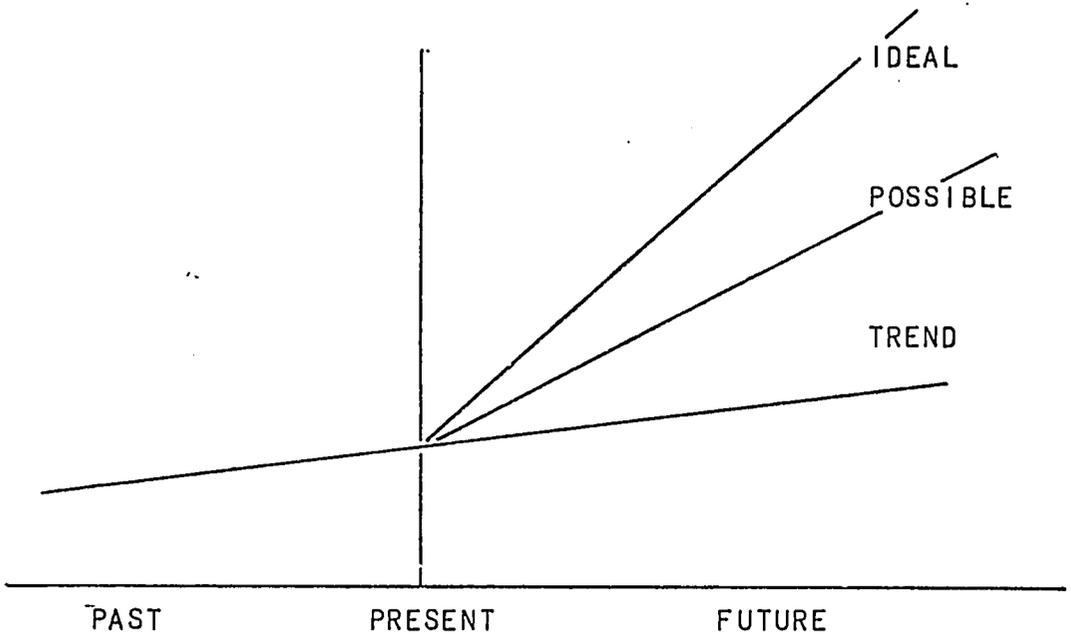
- 1) What are the present situations of farmers and other local people related to food-crop production and marketing?
- 2) What are the potentials for these local people to improve food-crop production and marketing?
- 3) What obstacles now prevent these people from reaching their full potentials?
- 4) How can we help them to overcome these obstacles?



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Often, the focus of field visits, farmer surveys, baseline studies, and other exercises related to food-crop development has been on describing farmers' present situations or previous practices.

This is only part of the analytical task. We must also diagnose why problems exist or practices have not changed. We then must look ahead to the future. And when looking to the future, we must be clear as to whether we are examining information related to 1) present trends, 2) ideal changes, and 3) changes that can actually be achieved.



B1. Baseline studies.

- B1.1 Some overall aspects of baseline analysis.
- B1.2 Specific baseline study steps and data needs.
- B1.3 The usefulness of interviewers' observations after a survey is completed.
- B1.4 Possible outline for baseline study report.

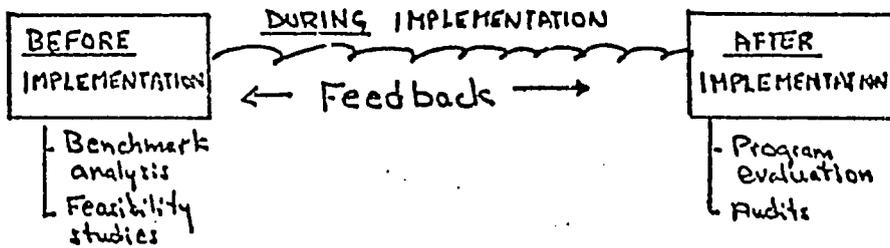
B2. Rapid rural reconnaissance.

- B2.1 Kinds of facts about farmers' situations and local food-crop systems that are useful.
- B2.2 Suggested timetable for a rapid rural appraisal of a village agroeconomy.
- B2.3 The usefulness of maps and diagrams for depicting local situations.

B3. Farm records.

- B3.1 An example of descriptive analysis of farm record information for a single crop.
- B3.2 An example of how farm records can be used to compare groups of farmers.
- B3.3 Another example of cross-tabulation analysis with farm record data.
- B3.4 Regression analysis of farm records to estimate resource productivity.

New food-crop development programs and projects are often begun with "baseline" or "benchmark" studies. Usually these include surveys of farmers in the proposed locations. Sometimes there is unclear thinking about the purpose of such studies. The next several pages highlight some important aspects of baseline analysis.

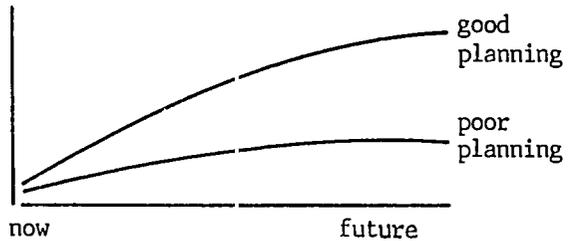


After identifying goals and strategies, but before designing specific programs and projects, it is important to learn more about the province or kabupaten (district) where the activities will take place. The process of collecting and analyzing such information has various names, such as "baseline studies", "benchmark analysis", and "developmental investigation".

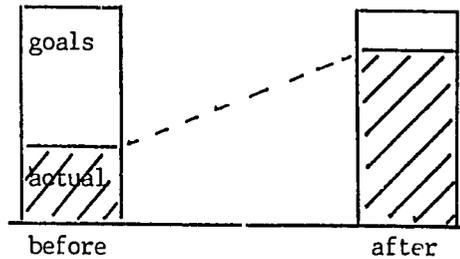
Why baseline analysis?

Baseline analysis usually has two overall objectives:

1. To provide facts leading to better design of food-crop development activities.



2. To provide a basis for evaluating results at the end of the project.



Specific information needs

Questions that often have to be answered by baseline studies are listed on the next page. Also shown are possible sources of this information.

<u>Question to be answered</u>	<u>Sources of information</u>
What crops are now grown and marketed, and what are the trends?	->Agricultural census data. Current statistics. Land-use maps. Special farm & mkt. surveys.
What food crops have the best <u>agronomic</u> potentials?	->Soil maps. Experimental results. Local tests and demonstrations.
Which of these food crops have the best <u>economic</u> potentials?	->Demand studies and forecasts. Comparative advantage studies. Studies of marketing trends. Farm budget (or LP) analyses.
Do farmers in these areas have access to the needed finance, inputs, technical information, and marketing services?	->Surveys of local government agencies, cooperatives, and private businesses. Farm survey information.
Taking national Palawija goals into account, in which areas (where) would it be best to begin?	->Besides the above facts, local information about places with poor nutrition, unemployment, low income, population growth.
What means of communication can best be used to encourage farmers to adopt recommended food-crop systems?	->Surveys of farmers, extension workers, and communication media.
Should special seed, storage, or processing facilities related to these crops be established? And who could best do this?	->Preliminary analysis of benefits and costs. Surveys of local agencies, cooperatives and businesses.
Can local people be encouraged to use more of these food crops? If so, how can this be done?	->Surveys of households, school children, women's groups and other consumer groups.

What if there isn't time or money to do everything?

Complete baseline analysis utilizes both secondary data (facts already collected and reported by other persons) and primary data (facts that you obtain yourself through surveys, experiments, and pilot projects). But sometimes it is not possible to finance studies to obtain primary data, or to wait until the results are completed.

In this case, at least three things might be done:

1. Make sure you are utilizing all the secondary information available. For example, in nearby universities you may find unpublished theses and term papers that tell about local farmers' situations.
2. Utilize results of studies in other places that you believe are similar. Each farming area has a unique combination of characteristics. Even so, there may be relevant insights from studies of cropping practices, adoption of new practices, marketing systems, food consumption trends, etc. that have been conducted elsewhere.
3. Utilize the knowledge of local people who know farmers' situations. If one cannot conduct extensive surveys of farmers themselves, a next-best alternative is to talk with persons (e.g., local-level extension workers) who have worked closely with farmers. One can ask them to describe typical farm situations, to tell about problems farmers have faced, and to suggest things that could be done to help these farmers. It is important to select these resource persons because of what they know, and not just because they have an important position. Obtaining facts and opinions from a panel of several persons can be helpful. Some methods can be used, such as the Delphi method and the nominal group

technique, to produce a consensus of judgments that is not biased.

Who should collect the information?

For either bringing together secondary information already available, or obtaining new primary information, one can consider several options. Each has advantages and disadvantages:

1. Hiring consultants. Consultants are likely to be experienced in doing the assigned task, efficient, and able to deliver results on time. But they may not take interest in the goals of the program, or in explaining methods and results to program staff.
2. Involving professors and students at nearby universities. University people may not be so efficient, since classroom schedules can interfere. Sometimes they are more interested in "high-powered" methods and academic writing than in solving practical problems. But involvement of professors and students can be a good way to stimulate them to learn about local needs and to relate their skills to these needs.
3. Involving national and local agency staff. The results may not be so "scientific" or unbiased. But having the agency's own staff help to collect and analyze baseline information can be a good way to ensure that they understand the local situation. It can also be a way to encourage use of baseline information in the design of food-crop development programs. Important offshoots may be a) staff becoming acquainted with local people, b) seeing their roles in broader perspective, and c) approaching program decisions more systematically and objectively.

The economics of information collection and analysis

It is always possible to use more information about farming areas than you already have available. More surveys and local crop trials can help to improve the design of local food-cropping systems and programs. But it will take time and money to obtain this additional information. It may delay initiation of the action program and result in your having less money for implementation of the program.

When deciding how much baseline information to collect and analyze, and which kinds of information to emphasize, it is useful to keep in mind three concepts from economics:

1. Diminishing returns. After some basic information has been assembled and reviewed, we may have a reasonably good understanding of the program site. We then should ask: will additional information be worth the additional time and funds needed to obtain this information?
2. Opportunity cost -- the benefits foregone when diverting time and money from one activity to another. We should ask: if we put resources into this proposed survey or experiment, what other work does this mean that we have to cancel or postpone?
3. Risk. Baseline studies can help to reduce risk of making costly mistakes about new kinds of food crops to promote, pricing of fertilizer and seed, credit and marketing arrangements, location of a new processing plant, etc. Farmers are exposed to many risks: drought, flooding, price fluctuations, crop diseases, insect attacks, and uncertainties about future government policies. Most farmers cannot absorb large losses. We hope that new food-crop systems will reduce

these risks, and not make these risks worse. So it is important that baseline studies include analysis of previous and potential risks -- the probabilities of reversals and the effects if these reversals do take place.

Questions for thought and discussion

1. Perhaps you are familiar with the baseline studies that were completed for earlier phases of the Palawija program. If so, which kinds of information have been most useful? Was some of the information not very useful? Do you wish some additional information had been obtained?
2. Suppose that you asked to be leader of a team to do a small benchmark study for a pilot Palawija project in a new province (e.g., Sumatera Barat). Two staff members are assigned to help you. You are given a budget of Rp5,000,000 and one vehicle. The task must be completed within two months. The main objective of the study is to help make plans for the pilot project.

What kinds of information would you seek at national, provincial, and local levels? From whom and how would you try to obtain this information?

3. Suppose that the main objective of the baseline study described in #2 is to establish a basis for evaluating results after the pilot project has been completed. Would you collect the same kinds of information? Or would different information be needed?

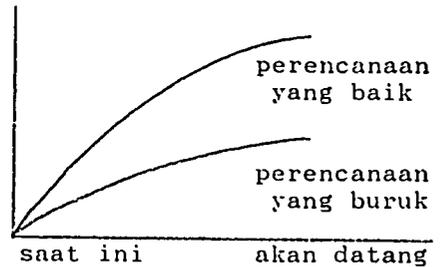
(ANALISIS DASAR)

Setelah kita mengidentifikasi sasaran dan strategi, tetapi sebelum kita merancang program dan proyek yang spesifik, perlu untuk lebih mempelajari mengenai propinsi atau kabupaten (daerah) dimana kegiatan akan dilaksanakan. Proses pengumpulan dan analisis informasi seperti itu mempunyai nama yang bervariasi, antara lain "baseline studies", "benchmark analysis", and "developmental investigation".

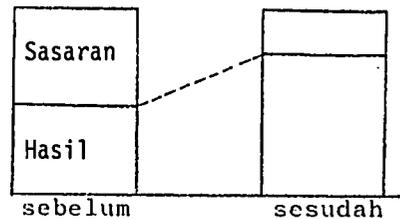
Mengapa baseline analysis?

Baseline analysis biasanya secara keseluruhan mempunyai 2 sasaran yaitu:

1. Menetapkan fakta-fakta yang mengarah ke model kegiatan yang lebih baik untuk perkembangan tanaman pangan.



2. Menetapkan suatu dasar untuk hasil-hasil evaluasi akhir dari suatu proyek.



Kebutuhan akan informasi yang spesifik.

Pertanyaan-pertanyaan yang seringkali terjawab melalui baseline studies tertera pada halaman berikutnya. Juga menampilkan sumber-sumber informasi yang memungkinkan, untuk informasi tersebut.

Pertanyaan yang diajukan

Sumber informasi

Tanaman apa pada saat ini diusahakan, bagaimana pemasarannya, serta bagaimana perkembangannya.

- Data sensus agronomi.
- Statistik yang sedang berjalan.
- Peta penggunaan lahan.
- Pertanian khusus dan survei pemasaran.

Tanaman pangan apa yang mempunyai potensi agronomi terbaik.

- Peta tanah.
- Hasil-hasil penelitian.
- Percobaan dan demonstrasi daerah setempat.

Tanaman palawija apa yang mempunyai potensi ekonomi terbaik.

- Studi permintaan dan perkiraan.
- Studi perbandingan keuntungan.
- Studi kecenderungan pasar.
- Analisis anggaran petani

Apakah petani setempat mempunyai sumber keuangan, input, informasi teknis, dan pelayanan pemasaran.

- Survei oleh pemerintah setempat, koperasi, dan bisnis swasta.
- Informasi survei pertanian.

Di daerah mana yang terbaik untuk dimulai program tersebut.

- Disamping data di atas, informasi setempat mengenai daerah dengan gizi rendah, pengangguran, pendapatan rendah, pertumbuhan penduduk.

Bagaimana cara komunikasi terbaik untuk mendorong petani melaksanakan sistem yang dianjurkan.

- Survei ke petani, penyuluh pertanian, dan media komunikasi.

Haruskah disediakan benih khusus, penyimpanan, atau fasilitas untuk memproses hasil panen; dan siapa yang terbaik untuk mengerjakannya

- Analisis pendahuluan untuk keuntungan & harga
- Survei ke wakil setempat koperasi, & bisnis.

Dapatkah penduduk setempat didorong untuk lebih memberanikan diri menanam tanaman pangan. Bila mungkin, bagaimana hal itu dapat dilakukan.

- Survei ke keluarga/rumah tangga, murid sekolah, PKK/kelompok wanita, dan kelompok konsumen lainnya.

Apa yang dapat dilakukan bila tak ada waktu dan uang.

Baseline analysis yang lengkap menggunakan data sekunder (data yang telah dikumpulkan dan hasil laporan orang lain) dan data primer (data yang saudara dapatkan melalui survei, percobaan, dan pilot project). Namun terkadang tidaklah mungkin membiayai studi-studi untuk mendapatkan data primer, atau menunggu sampai hasilnya lengkap/komplit.

Dalam kasus ini, setidaknya ada 3 hal yang harus dikerjakan:

1. Yakini bahwa saudara menggunakan seluruh data sekunder yang ada/berlaku. Misalnya, di Universitas terdekat mungkin saudara menemukan tesis yang tidak dipublikasikan dan term papers yang memberikan informasi mengenai situasi petani setempat.

2. Gunakan hasil studi dari tempat lain yang saudara anggap sejenis. Setiap daerah pertanian mempunyai suatu kombinasi karakteristik yang unik. Walaupun demikian, mungkin terlihat relevan dari studi pelaksanaan pertanaman, penyerapan sistem yang baru, sistem pemasaran, kecenderungan konsumsi makanan, dan lain-lain yang sudah berlaku dimana-mana.

3. Menggunakan pengetahuan masyarakat setempat yang tahu situasi/keadaan petani. Jika seseorang tidak mampu melakukan survei yang ekstensif ke petani, kemungkinan yang terbaik adalah berbicara/ngobrol dengan masyarakat (seperti penyuluh tingkat daerah) yang telah bekerja dekat dengan para petani. Seseorang dapat bertanya kepada mereka untuk menggambarkan keadaan/type pertanian, mengatakan masalah yang dihadapi petani, dan menganjurkan hal-hal yang dapat dikerjakan untuk membantu para petani tersebut. Ini penting untuk menyeleksi sumber masyarakat tersebut karena mereka itu tahu, dan tidak hanya karena mereka mempunyai posisi/kedudukan yang penting. Mendapatkan data dan opini dapat dibantu dari suatu panel yang terdiri dari beberapa orang. Beberapa cara dapat digunakan, seperti cara Delphi dan teknik grup nominal, untuk menghasilkan kesepakatan pendapat yang tidak bias.

Siapa yang seharusnya mengumpulkan data.

Agar setiap data sekunder yang dibawa sekalian segera tersedia, atau mendapatkan data primer yang baru, satu data dapat mempertimbangkan beberapa pilihan. Setiap pilihan mempunyai keuntungan dan kerugian:

1. Kontrak kerja dengan konsultan. Konsultan mungkin berpengalaman dalam membuat penentuan tugas, efisien, dan dapat memberi hasil tepat pada waktunya. Tetapi mereka mungkin tidak tertarik pada tujuan/sasaran program, atau dalam penjelasan metoda/cara dan hasil kepada staf proyek.
2. Melibatkan profesor dan mahasiswa di universitas terdekat. Orang universitas mungkin tidak begitu efisien, karena jadwal kuliah dapat mengganggu. Seringkali mereka lebih tertarik pada metoda *high-powered* dan karya tulis daripada memecahkan masalah-masalah yang praktis. Tetapi pelibatan mereka dapat merupakan suatu cara yang baik untuk merangsang mereka mempelajari kebutuhan-kebutuhan daerah setempat dan hubungan kebutuhan daerah tersebut dengan keahlian mereka.
3. Melibatkan pusat dan staf wakil dari daerah setempat. Hasilnya mungkin tidak begitu ilmiah atau tidak bias. Akan tetapi mempunyai (wakil) staf sendiri yang membantu mengumpulkan dan menganalisis informasi dasar; merupakan jalan yang baik dengan jaminan mereka mengerti situasi setempat. Itu juga merupakan suatu cara yang mendorong penggunaan informasi dasar dalam rancangan program pengembangan tanaman pangan. Bagian-bagian yang penting mungkin: a). staf saling mengenal dengan orang daerah, b). memahami peran mereka dalam perspektif yang luas, dan c). keputusan program mendatang lebih sistematis dan obyektif.

Segi ekonomi dari pengumpulan dan analisis data.

Selalu mungkin lebih menggunakan data mengenai areal pertanian daripada menggunakan data yang saudara dapat. Lebih banyak survei dan percobaan tanaman setempat dapat membantu memperbaiki sistem dan program pola tanam. Tetapi memerlukan waktu dan uang untuk mendapatkan informasi tambahan tersebut. Mungkin terlambat memulai kegiatan dan hasil program, dalam keadaan keuangan yang sedikit untuk pelaksanaan program/proyek.

Saat memutuskan berapa banyak data/informasi dasar yang dikumpulkan dan dianalisis, dan jenis informasi/data yang dititikberatkan, perlu dipahami 3 konsep ekonomi:

1. Diminishing returns. Setelah beberapa informasi dasar dikumpulkan dan ditinjau kembali, kita mungkin punya suatu pengertian kelayakan yang baik dari segi program. Kita kemudian harus bertanya: dapatkah informasi tambahan senilai dengan penambahan waktu dan dana yang dibutuhkan untuk mendapatkan informasi ini?.
2. Opportunity cost --- keuntungan terdahulu saat pengalihan waktu dan uang dari satu kegiatan ke kegiatan lainnya. Kita harus bertanya: jika kita memasukkan sumber ke dalam survei atau percobaan yang diusulkan, pekerjaan apa lagi yang harus kita batalkan atau kita tunda?
3. R i s k. Baseline studies dapat membantu mengurangi resiko dalam membuat kesalahan harga mengenai jenis tanaman pangan baru yang dipromosikan, pemberian harga pupuk dan benih, rencana kredit dan pemasaran, lokasi untuk memproses tanaman yang baru, dan lain-lain.
Para petani tidak terhindar dari beberapa resiko: musim kering/kemarau, banjir, fluktuasi harga, serangan hama dan penyakit, dan ketidaktentuan kebijakan pemerintah mendatang. Kebanyakan para petani tidak dapat menerima kerugian yang besar. Kita berharap bahwa sistem tanaman pangan yang baru akan mengurangi resiko-resiko tersebut, dan tidak memperburuk resiko tersebut. Karenanya baseline studies penting dianalisis sebelumnya dan resiko yang berpotensi ----
kemungkinan dari kerugian dan akibatnya jika kerugian ini terjadi.

Pertanyaan untuk dipikirkan dan didiskusikan.

1. Mungkin saja saudara terbiasa dengan baseline studies yang lengkap untuk taraf permulaan program palawija. Kalau begitu, jenis informasi/data mana yang paling berguna? Adakah beberapa informasi yang tidak begitu berguna? Apakah saudara berharap penambahan beberapa informasi?

2. Andai saudara memimpin suatu tim yang mengerjakan suatu benchmark study yang kecil untuk sebuah pilot project palawija di propinsi baru (misalnya Sumatera Barat). Dua orang anggota staf ditetapkan untuk membantu saudara. Saudara diberi anggaran dari Rp. 5.000.000,- dan satu unit kendaraan. Tugas harus dilengkapi dalam waktu 2 bulan. Obyek utama dari study ini adalah membantu membuat rencana untuk pilot project.

Jenis informasi yang mana yang akan saudara cari pada tingkat nasional, propinsi, dan daerah setempat/kabupaten? Dari siapa dan bagaimana saudara mencoba mendapatkan informasi ini?.

3. Andai obyek utama dari baseline study yang disebutkan pada poin ke 2 adalah menentukan dasar untuk mengevaluasi hasil setelah pilot project dilengkapi. Maukah saudara mengumpulkan informasi/data yang berjenis sama? Atau data yang berbeda yang diperlukan?

David W Brown and Irma Hermin M.
December, 1988.

SPECIFIC BASELINE STUDY STEPS AND DATA NEEDS

B1.2

BASELINE STUDY STEPS

INFORMATION SOURCES & ANALYSES

CLASSIFY AND SELECT AREAS
on the basis of
Foodcrop Potentials
and Human Needs

- * Maps of soils, climate, land use, population, etc.
- * Census data and current statistics.
- * Results of foodcrop experiments, trials, & demonstrations.
- * Baseline studies previously completed for other projects.
- * Demographic facts and previous socio-economic studies.

**IDENTIFY FEASIBLE PRODUCTION
AND MARKETING SYSTEMS**
Using Agronomic and
Economic Analysis

- * Agronomic recommendations and guidelines.
- * Available cost-and-returns and price data.
- * Production-function analysis of trial and demonstration results.
- * Farm budget (or linear programming) analysis of production, marketing, & finance options for typical farmer situations.

**LEARN MORE ABOUT FARMERS'
SITUATIONS IN PILOT AREAS**
Local Obstacles, Attitudes,
Services, Information Sources

- * Sample survey of farmers in and near pilot sites.
- * Interviews with local leaders, shopkeepers, credit sources, etc.
- * Information from local extension workers.
- * Socio-economic studies previously completed in the area.
- * Case studies of some contrasting farm families & their surroundings.

DEVISE SUSTAINABLE STRATEGY
for Developing Foodcrop
Systems to Full Potentials

- * Brainstorming sessions, local panels, etc. to examine facts, pinpoint aspects needing attention, and formulate ideas about basic approaches, and key action and information ingredients, to stimulate development of foodcrop systems in the target areas.

**MAKE REALISTIC PREDICTIONS
OF COSTS AND BENEFITS**
Impacts on Typical Farmers,
Other Groups, Entire Area

- * Estimated effects of major options on typical farmers' productivity, incomes, and financial risks, within and near pilot sites.
- * Predicted spread-effects of pilot activities, direct and indirect.
- * Estimated total area-wide impacts, short and long run.
- * Attention to intangible costs and benefits.

SUGGEST IMPLEMENTATION PLAN
Who should be involved?
What overall steps?
How to monitor/evaluate?

- * Via interaction with key officials and groups, insights gained from the baseline study used to help make implementation plans under various assumptions about levels of funding and cooperation.
- * Suggest indicators, information sources, and procedures for staying in touch with progress, revising plans if needed, and evaluating overall results.

TABRAN BASELINE SURVEY

B1.2 Ind

KARTON-KARTON
SUKSES DATA
SEKONDIR

PEPANI SARPEL

DATA DIET PARA
ASLI, PEROLA
WAST, PPL, PPM,
DI GABUNG SURVEY

TABAN PENGUMPULAN DATA

1. Palawija
 - a. Trends luas areal, produksi, Produktivitas, hasil/hektar, harga, Penanaman dan Pemanfaatannya (Data tingkat propinsi)
 - b. Agroklimatic, agrochologi, Penelitian sowe, fasilitas khusus, program khusus, masalah-masalah khusus yg ada hubungannya dengan
2. Data Tanaman Pangan lainnya
3. Peternakan, Perikanan dan lain-lain.

1. Palawija
 - a. Praktek budidaya, produksi, Penanganan Pasca panen, penanganan
 - b. Tingkat penggunaan input (benih, pupuk, pestisida, termasuk dll)
 - c. Produktivitas, tenaga kerja, tanah, sumber keuangan.
 - d. Sumber informasi teknik dan Pasar.
 - e. Usulan-usulan perbaikan dalam pelaksanaan budidaya
 - f. Hambatan-hambatan yang dihadapi dalam melaksanakan budidaya
 - g. perubahan-perubahan, cara dan ide pemecahan masalah.
 - h. Situasi Pelayanan input
 - i. Peadapatan usaha tani palawija
 - j. Tingkat kerjasama antara daerah dalam hal praktek produksi, supply input, penanganan, pemanfaatan dan sumber keuangan.
2. Data tanaman pangan lainnya secara garis besar
3. Peternakan, Perikanan, dan lain-lain

1. Palawija
 - a. Tanggapan terhadap perbaikan pengembangan palawija
 - b. Masalah-masalah yang dihadapi dan cara pemecahannya (seperti questionnaire pada masa Yagasan Tamar)
2. Tanaman Pangan lainnya, Peternakan, dan Perikanan dan lain-lain

[Gua-idea untuk pemecahan masalah Pengembangan Palawija khususnya dan Pengembangan Tanaman Pangan umumnya dan sektor lain dan akhirnya secara untuk peningkatan pendapatan petani.

TABAN ANALISA DATA

1. Analisa Data survey
2. Analisa cara budgeting / linier programming
3. Analisa lainnya

TABAN PENGUATAN LAPORAN

- Penyusunan Laporan, dan tujuan studi dicapai yaitu:
1. Memperoleh data/gabaran keadaan saat ini hubungannya dengan perpalawija khususnya, dan tanaman pangan lain pada umumnya perihal, cara berproduksi, penanganan dan pemanfaatannya ditingkat propinsi dan daerah survey.
 2. Mengenal potensi yang ada untuk memperbaiki/merupakan produkt, penanaman, dan pemanfaatan palawija khususnya dan tan. pangan lain dilihat dari survey.
 3. Memperoleh gambaran perihal sumber pendapatan dan kemampuan keluarga tani, Orang-orang yang berkeh membantu perubahan-perubahan dalam system palawija dan tan. pangan lainnya, hambatan-hambatan yang mereka hadapi, secara kegiatan, pengembangan teknologi, serta bantuan-bantuan lain yang membantu mereka dalam memecahkan masalah.
 4. Memperoleh indikator/petunjuk dalam praktek palawija, produktivitas, pemanfaatan dan program sosial ekonomi lain yang dapat mempercepat pertumbuhan dan pelaksanaan pada tingkat petani dan tingkat daerah.

oleh Is. Moman
SFCBP

BY 2/2/77/01/28/84

THE USEFULNESS OF INTERVIEWERS' OBSERVATIONS B1.3 (1)
AFTER THE SURVEY IS COMPLETED

The persons who have conducted a farm survey usually learn much from the experience that goes beyond the questionnaire itself. "Debriefing" and discussion can bring to light insights that help 1) to improve interpretation of the data and 2) to improve the methods used in future studies. Listed below are some questions that might be discussed with the enumerators after they have finished the survey:

1. What was the most interesting or surprising thing that you learned from this survey experience?
2. How would you describe the farms in this study area -- good land? mostly traditional practices? some unusual specialties? full-time farming? good family living level? nearly everyone a small farmer with his own land, or also tenants or some large operations? many landless, low-income families? etc.
3. Draw a sketch-map of the survey area to show geographic features, types of land-use, roads, nearby towns and cities, locations of markets and other facilities, and locations of farmers in the sample.
4. Do the farmers and their families have some special problems that seem to deserve attention?
5. Are there some ethnic characteristics of people in the area that are important when thinking about ways to improve food-crop systems and programs?
6. Would you yourself like to live and work in this farming area? If not, what improvements would make it more attractive?

7. If you had some money to invest and wanted to go into farming or start a small business in the area, what use would you make of the funds?
8. How easy is it for these farmers to obtain the technical information, credit, inputs, and post-harvest services needed for improved farming systems?
9. What factors do the farmers seem to take into account when making farm management decisions? Do family members or others in the village have influence on these decisions?
10. What do you think this farming area will be like 5 or 10 years from now -- much the same as now? more commercialized? many young people will have moved away? more part-time farming? soil erosion problems? other important changes?
11. Which information on the questionnaire was the most difficult or time-consuming to obtain? Which information do you feel was the most unreliable? Why? (Could ask the enumerators to rate each question according to difficulty and reliability.)
12. If you were doing this kind of survey again, what changes would you make ...in sampling and survey procedure?...in questions asked? ...in the way you ask the questions?
13. Do you have any observations about the effectiveness of extension work, cooperatives, and other government programs in the area, and ideas about how they could be improved? To what extent are staff at province and district levels well acquainted with local farmers' situations and potentials?

POSSIBLE OUTLINE FOR BASELINE STUDY REPORT B1.4 (1)
SFCDP-USAID BASELINE STUDIES IN SUMBAR, NTT, & NTB

SUGGESTED STUDY REPORT OUTLINE

CHAPTER I Descriptive Overview of Recent Trends and Current Production and Marketing Patterns related to Palawija

Trends in production, yields, prices, utilization, etc.

General picture of who is producing palawija crops, and how they are marketed, processed, and utilized

CHAPTER II Future Potentials and Needs for Palawija in the Province

Crops and places with the greatest economic potentials

Places where palawija could improve family living

Places where palawija could cause soil erosion problems

CHAPTER III Viable Palawija Production and Marketing Systems in the High-Priority Areas

New technologies and systems that might be introduced and promoted -- production and post-harvest

Farm management analysis of proposed cropping practices and systems

Economic analysis of post-harvest alternatives -- storage, marketing, local uses, commercial outlets

Likely effects of proposed palawija systems on local earnings, employment, and nutrition

CHAPTER IV A Closer Look at Local Situations in the Priority Areas

Survey information and case studies about:

Available agri-services related to foodcrop
finance, input supply, production, and marketing

Sources and channels of information

Obstacles to improvement of foodcrop production
and marketing systems

Attitudes toward overcoming these obstacles

Important groups and leaders for stimulating change

CHAPTER V Suggested Ways to Help Make the Most of Palawija Potentials in the Province

Essential ingredients for inducing improvements

Who could do what at local levels

How province and national agencies can reinforce

Likely area-wide impacts, and benefits and costs,
of proposed strategies

Implementation and evaluation suggestions

In recent years development specialists have come to realize that:

- 1) Local people have many insights which are very useful when designing agricultural experiments, extension programs, and other activities.
- 2) Many kinds of insights are important besides statistical data.
- 3) Involvement of local people during the analysis and planning stages makes them want to help the program to succeed.
- 4) Few agencies have the time or money to undertake comprehensive baseline and evaluation studies.

Out of this awareness has come an approach called "rapid rural appraisal" or "rapid rural reconnaissance". Its main features are summarized below:

Techniques Employed	Classical	RRA
Statistical analysis	Often a major part	Little or none, uses triangulation
Formal questionnaires	Often included	Avoided
Interviews with local farmers and key informants	Through formal questionnaire if at all	A major component using semi-structured interviewing
Qualitative descriptions and diagrams	Not as important as the 'hard data'	Considered at least equally as important
Sampling	Statistically acceptable sample sizes regarded as necessary. Often random sampling	Often small sample size, selecting 'key' areas, or farms, households etc. 'Statistical' requirements not always adhered to
Consulting secondary data sources	Yes	Yes
Measurements	Detailed, accurate	Qualitative or indicators used
Group discussion	Informal sessions	Via workshops and brainstorming

Source: Gordon R. Conway and Jennifer A. McCracken, "Rapid Rural Appraisal and Agroecosystem Analysis", page 16, monograph from International Institute for Environment and Development, London, 1987.

FACTS ABOUT FARMERS' SITUATIONS
AND LOCAL FOOD-CROP SYSTEMS
THAT ARE USEFUL

B2.1

On the following four pages is a checklist that we on the SFCDP team prepared. It was intended for use when first visiting provinces that were going to be included in pilot secondary food-crop development activities.

Of course you will want to make a checklist that fits your particular objectives and information needs, when making a reconnaissance visit.

Such checklists help to make sure that you use your time well and talk with the right people.

David Brown, SFCDP, 13 October 1988

NEW PROVINCE PRE-STUDY CHECKLIST
INITIAL INFORMATION TO SEEK AT PROVINCE LEVEL

1. Information useful in selecting pilot areas and crop systems to be encouraged
 Maps -- soil, land-use, watersheds, etc.
 Population densities and growth patterns
 Economic potentials
 Marketing & transportation outlets
2. Information about proposed pilot areas
 Good palawija production potentials?
 Which palawija crops?
 How could fit into existing crop-livestock systems?
 Mainly for local use? Or to sell to other places?
 Many low-income people?
 Off-farm job outlets?
 Near market and service centers?
 Special ethnic characteristics
 Special land tenure features
3. Communications
 Nearby mass communications outlets - radio, newspapers, etc.
 Extension programs that might build upon
 Commercial information or promotion activities
4. Regional expertise
 Universities
 Experiment stations
 Extension specialists
 Specialists in other ministries
 Commercial specialists
 Other international assistance groups
 National>province>local communications means
 Staff transport capabilities
5. Previous studies
 Experiments & local trials
 Farm surveys
 Baseline & evaluation studies for other projects
 Student theses
 Local, area level economic analyses
6. Province leadership
 Key officials
 Informal legitimizers in and outside government
 Key groups and leaders at local levels
7. Program formation and implementation processes
 Key steps and actors
 Meshing with overall programs
 Key times to make plans

NEW PROVINCE PRE-STUDY CHECKLIST
WHEN STOPPING TO TALK TO EXTENSION WORKER BRIEFLY

1. What are your main program activities this year?
Some special programs, target audiences, or methods being emphasized?
Other roles and "chores" besides educational work?

2. What are your views about palawija in this area?
Is there much potential for palawija production? Which crops?
How can palawija fit into overall crop and livestock system?
Are farmers already shifting to this rapidly? Or do serious problems have to be overcome?
What local potentials for palawija marketing and processing?
Can palawija have an important place in local family diets?

3. What influences farmers' and households' decisions related to palawija?
What considerations do farmers and families take into account?
profit potentials? initial costs? risk of losses? the amount of extra work entailed? the opinions of neighbors? actually seeing local trials and demonstrations?
Who in the desa seems to have the most influence on farmers' and families' decisions related to palawije?
Do farmers who do not own their land have much to say about food crop production?
Within extension, how can people get information and advice?
What other information sources seem to be useful?
shopkeepers? cooperatives? commercial salesmen? radio?

4. Any ideas about useful SFCDP roles and methods?
Overall, how can SFCDP help speed up progress?
Ideas about the usefulness and best design of:
demfarms? local trials? credit needs?
seed supply? mass media? competitions?
market information nutrition education other helps?
How to reach smaller farmers and poorer families?
How to reach remote places?
What roles can the private sector have?
How to mesh with other extension and area development programs?

NEW PROVINCE PRE-STUDY CHECKLIST
WHEN STOPPING TO TALK TO SHOPKEEPER OR BUYER OR CO-OP BRIEFLY

1. What things selling/buying?
Farm crops? livestock?
Fertilizer? seed? pesticides? equipment & tools?
Sacks or other containers?
Animal feed?
Food items for people: rice? palawija? snack foods?
2. What services providing?
Custom land preparation? spraying? other farm operations?
Animal health services?
Seed processing and storage?
Milling/processing of grain or other crops?
Technical information of use to farmers?
Credit to farmers or rural households?
Transportation of inputs or outputs?
3. What trends in goods/services bought/sold?
Some goods/services increasing? decreasing?
Now coming from/going to new places?
Why are these changes taking place?
4. What is happening re secondary food crops?
Farmers producing more palawija?
Farmers buying better seed and other modern inputs?
Local households consuming more? Do they like palawija?
New local processing plants or small-scale industries related to palawija?
Prices tending to increase or decrease?
Quality tending to improve?
5. What ideas about future potentials and needs?
What future potentials in the area related to palawija?
Can small shops, buyers, and processors compete with large operations?
Any obstacles/problems preventing progress?
Any ideas about how programs like SFCDP can help overcome obstacles or speed up progress?

NEW PROVINCE PRE-STUDY CHECKLIST
WHEN STOPPING TO TALK TO FARMER BRIEFLY

1. System now
 What crops and livestock?
 What production practices for palawija crops?
 Where inputs obtained, and how paid for?
 How food crops are utilized - sold? fed to livestock? eaten?
 If sold, to whom? where? more than one possible buyer?
 Family members working on other farms or elsewhere?
 How much land? Owned?

2. Any recent changes in farming system or employment?
 Kinds of crops and livestock produced?
 Food crop production practices?
 Sources of inputs and finance?
 Utilization or marketing of food crop production?
 Off-farm work?
 Amount of land and ownership?

 What were the reasons for these changes? What led to these changes?

3. Family likes to eat palawija crops?
 What are the main foods eaten by family members?
 Any recent changes in diets? What led to changes?
 If had more production or money, would change family diet?
 If doesn't like palawija crops, why not?

4. What memberships and sources of information?
 Belongs to local cooperative? farmer group? others?
 Wife, children in any groups?
 How gets information related to farming? radio? contact farmer? neighbors? extension workers? shopkeepers? buyers? others?

5. What plans for the future?
 Thinking about any changes in farming system? home consumption of food crops? off-farm work?
 Why considering these changes (focus especially on palawija)?
 What problems faced or help needed before can make changes?

DAFTAR PERTANYAAN STUDI-AWAL PROPINSI BARU
SECARA SINGKAT BILA BERTEMU DENGAN PENYULUH

1. Apa kegiatan program utama tahun ini?
 - Beberapa program khusus, target pendengar, atau metode yang ditekankan?
2. Apa pandangan Saudara mengenai palawija di daerah ini?
 - Apakah ada yang lebih berpotensi untuk hasil palawija? Tanaman apa?
 - Bisakah palawija cocok pada semua sistim tanam dan sistim peternakan?
 - Apakah petani sudah menggantinya dengan segera? ataukah merupakan soal yang serius untuk dipecahkan?
 - Apa potensi-potensi daerah dalam pemasaran palawija dan pengolahannya?
 - Dapatkah palawija mempunyai posisi penting dalam menu makanan keluarga (daerah)?
3. Apa yang mempengaruhi keputusan petani dan keluarganya mengenai palawija?
 - Atas pertimbangan apa petani dan keluarganya memilih/memperhitungkan keputusan tersebut:
 - potensi keuntungan? biaya dasar? resiko hilang? jumlah waktu pekerjaan tambahan? pengetahuan tetangga? melihat secara nyata percobaan dan demonstrasi di daerahnya?
 - Siapa di desa itu yang tampaknya banyak mempengaruhi keputusan petani dan keluarga sehubungan dengan palawija?
 - Apakah petani yang tidak mempunyai tanah sendiri yang banyak berbicara mengenai hasil/produksi tanaman pangan?
 - Bersama penyuluhan, bagaimana orang-orang mendapatkan keterangan/informasi dan gagasan
 - Sumber keterangan/informasi apa lagi yang mungkin berguna? pelayan toko? koperasi? penjual dagangan? radio?
4. Apakah ada Saran-saran lain mengenai manfaat peran dan cara SFCDP
 - Secara umum, bagaimana SFCDP membantu mempercepat kemajuan?
 - Saran mengenai kegunaan dan gambaran baik dari:

demfarm	percobaan setempat	kebutuhan kredit
pemberian benih	media massa	perlombaan/kompetisi
informasi pasar	pendidikan gizi	bantuan lain
 - Bagaimana menjangkau petani kecil dan keluarga miskin?
 - Bagaimana menjangkau tempat terpencil?
 - Peran apa yang dipunyai oleh sektor pribadi/swasta?
 - Bagaimana mengkaitkan dengan penyuluhan yang lain dan program pengembangan daerah?

DAFTAR PERTANYAAN STUDI- AWAL UNTUK PROPINSI BARU
JIKA MEWAWANCARAI SECARA SINGKAT
PADA PENJAGA TOKO, ATAU PEMBELI, ATAU KOPERASI

1. Barang-barang apa saja yang dijual/dibeli?
 - Tanaman pertanian? Ternak?
 - Pupuk? benih? pestisida? perlengkapan dan alat-alat?
 - Karung atau tempat barang yang lainnya?
 - Makanan ternak?
 - Kebutuhan manusia: beras? palawija? makanan ringan?
2. Pelayanan apa yang dibutuhkan?
 - Tradisi pemisahan tanah? penyemprotan? pengerjaan lahan lainnya?
 - Pelayanan kesehatan ternak?
 - Pengolahan benih dan penyimpanannya?
 - Penggilingan/pengolahan butir atau tanaman lainnya?
 - Informasi teknis untuk digunakan oleh petani?
 - Kredit bagi petani atau rumah tangga pedesaan?
 - Transportasi bagi input dan output?
3. Apa kecenderungan dalam barang/jasa pembelian/penjualan?
 - Penaikkan/menurunkan beberapa barang/jasa?
 - Datang/pergi dari tempat yang sekarang ke tempat yang baru?
 - Mengapa perubahan ini terjadi?
4. Apa yang terjadi pada palawija?
 - Petani menghasilkan lebih banyak palawija?
 - Petani membeli benih yang lebih baik dan input yang modern lainnya?
 - Keluarga setempat mengkonsumsi lebih banyak? Benarkah mereka menyukai palawija?
 - Tempat pengolahan setempat yang baru atau pabrik skala kecil untuk palawija?
 - Harga mengarah naik atau turun?
 - Kualitas/mutu menjurus ke arah perbaikan?
5. Usul apa untuk potensi dan kebutuhan di masa mendatang?
 - Di masa mendatang potensi apa yang ada di daerah ini yang berhubungan dengan palawija?
 - Dapatkah toko kecil, pembeli dan pengolah bersaing dengan operasi yang lebih besar?
 - Hambatan/masalah lain yang mencegah kemajuan?
 - Usul lain tentang bagaimana program seperti SFCDP dapat membantu memecahkan hambatan atau mempercepat kemajuan tersebut.

DAFTAR PERTANYAAN STUDI-AWAL UNTUK PROPINSI BARU
JIKA MENGINTERVIEW PETANI SECARA SINGKAT

1. Sistem saat ini

- Tanaman apa dan ternak apa?
- Bagaimana praktek produksi untuk tanaman palawija?
- Dimana input didapat, dan bagaimana membayarnya?
- Bagaimana tanaman pangan dimanfaatkan - dijual? makanan ternak? dikonsumsi?
- Jika dijual, kepada siapa, dimana, lebih dari satu pembeli?
- Anggota keluarga bekerja di sawah lain? atau dimana lagi?
- Berapa luas tanah? dipunyai atau tidak?

2. Apakah ada perubahan baru dalam sistem pertanian atau pekerjaan?

- Jenis tanaman dan ternak yang dihasilkan?
- Pelaksanaan produksi tanaman pangan?
- Sumber input dan dana?
- Pemanfaatan atau pemasaran produksi tanaman pangan?
- Bekerja di luar pertanian?
- Jumlah tanah dan pemilikannya?
- Apa penyebab perubahan ini? Apa yang mengarahkan ke perubahan ini?

3. Apakah keluarga suka mengonsumsi palawija?

- Apa makanan pokok yang dikonsumsi anggota keluarga?
- Ada perubahan baru dalam makanan? Apa yang mengarahkan ke perubahan ini?
- Jika ada kelebihan produksi atau uang? apakah merubah menu makanan keluarga?
- Jika tidak suka palawija? kenapa?

4. Apakah anggota dan sumber informasi?

- Lembaga daerah? kelompok tani? yang lain?
- Istri, anak dalam beberapa group?
- Bagaimana mendapatkan informasi mengenai pertanian? radio? kontak tani? tetangga? penyuluh? penjaga? pelayan toko, pembeli, lain-lain?

5. Apakah rencana untuk di masa mendatang?

- Memikirkan perubahan sistem pertanian? konsumsi keluarga terhadap tanaman pangan? bekerja di luar sektor pertanian?
- Apa yang dapat dipertimbangkan pada perubahan ini (terutama terhadap palawija)?
- Masalah apa yang dihadapi atau bantuan yang diperlukan sebelum membuat perubahan?

SUGGESTED TIMETABLE FOR A RAPID RURAL APPRAISAL B2.2
OF A VILLAGE AGROECOSYSTEM

DAY 1

1. Prepare for RRA
2. Search for and summarise secondary data

DAY 2

Morning:

1. Briefing meeting village leaders
2. Walk to vantage point
3. Indicate landforms on map
4. Walk transects through village, recording soils, crops, livestock, problems, opportunities

Afternoon:

5. Group interview with leading farmers
 - i) construct seasonal calendar of climate, water flow, crops, livestock, labour demand, marketing, problems
 - ii) construct decision tree for livelihood systems

DAY 3

Morning:

6. Single interviews with farmers selected to cover range of land holding. Construct bar diagram of family size, holdings of crops, trees, livestock, sources of income, grain purchased etc.

Afternoon:

7. Group interview with village leaders
 - i) Construct venn diagram of institutional decision making in village
 - ii) Time trend of population change
 - iii) Flow diagrams of marketing and production of major crops and of significant impacts of change in village life
 - iv) Historical profile of village

Source: Gordon R. Conway and others, "Rapid Rural Appraisal for Sustainable Development: Experience from the Northern Areas of Pakistan", page 16, monograph from International Institute for Environment and Development, London, 1987.

THE USEFULNESS OF MAPS AND DIAGRAMS
FOR DEPICTING LOCAL SITUATIONS

B2.3 (1)

Visual aids like the following can help tie the data together and "bring to life" what a farming area is like:

1. A village sketch map...

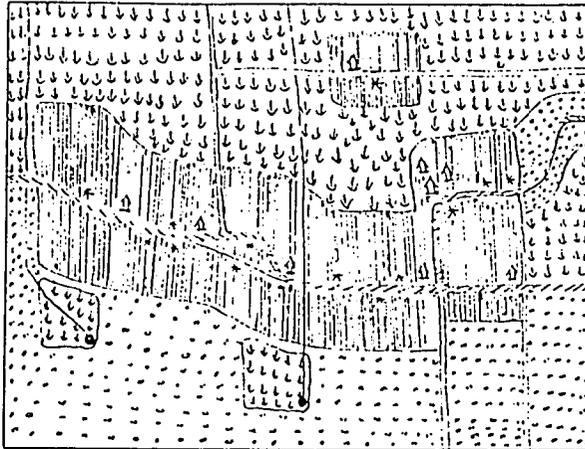
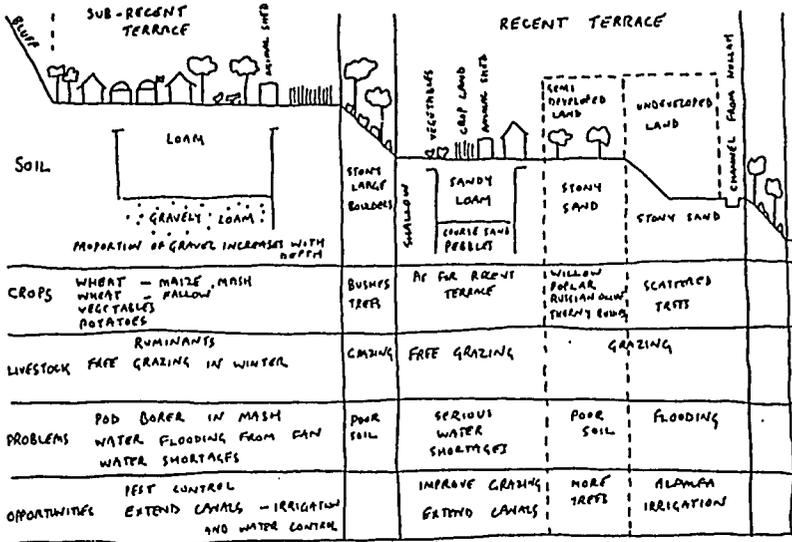


Figure 2.1. A Typical Desa in West Java.

-  Residential area.
-  Small shops or rice mills.
-  Public buildings: desa hall, elementary schools, mosques, and night-watches.
-  Provincial or regency road; it is managed by the provincial or regency governments.
-  Desa road; it is managed by the desa government.
-  Local water sources and simple irrigation canal (pengairan sederhana).
-  Wet-land rice fields (sawah).
-  Dry agricultural land ("tegalan" or "kebun").

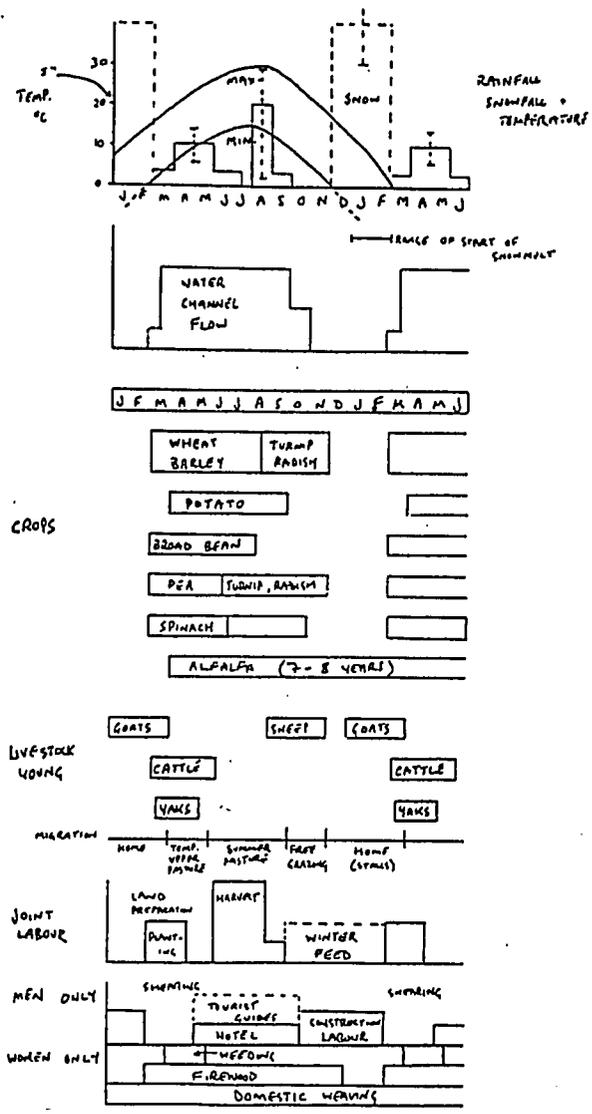
Source: Tuhpawana P. Sendjaja, Perspective Analysis of Small Community Capital Accumulation (PASCCA): A Model for Diagnosing Local Impacts of Agricultural Changes, with Applications to West Java Rice Villages, Ph.D. dissertation, University of Tennessee, June 1980, page 13.

2. A transect...



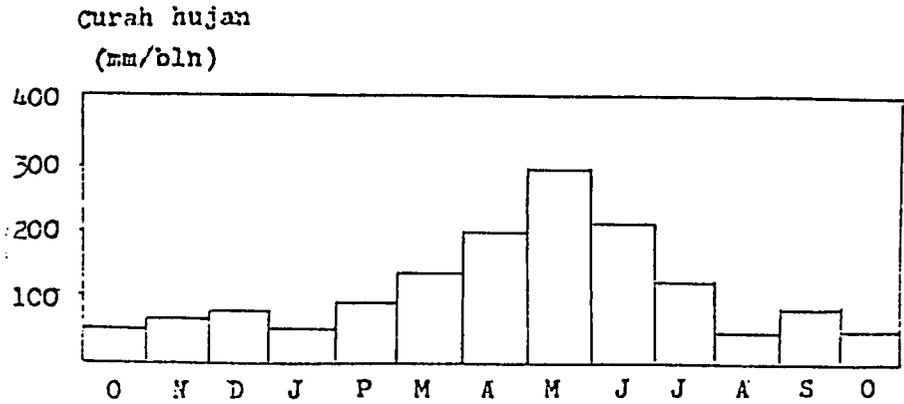
Source: Gordon R. Conway, "Diagrams for Farmers", monograph from International Institute for Environment and Development, London, 1987.

3. A seasonal calendar...

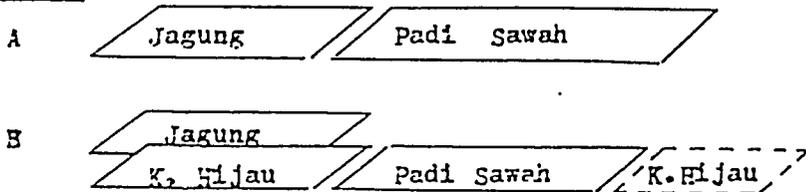


Source: Gordon R. Conway, "Diagrams for Farmers", monograph from International Institute for Environment and Development, London, 1987.

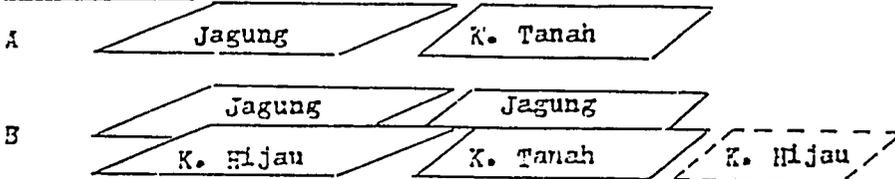
Kalender musim...



Tadah hujan



Lahan kering



Pola tanam dan rata-rata curah hujan 10 tahun
(1977-1986) di Kabupaten Wajo, 1983

Dari Rencana Penelitian Pola Tanam Menunjang Pengembangan Palawija pada Lahan Kering dan Sawah Tadah Hujan di Sulawesi Selatan, 1988/89, Balai Penelitian Tanaman Pangan Maros dengan SFCDP, Nop 1988.

Records of farmers' activities in previous seasons or years can be used in several ways:

1. Descriptive analysis.

- a) Calculations of costs, returns, and net income.
- b) Calculations of financial requirements and status.
- c) Measurement of efficiency.
- d) Information about non-money aspects -- e.g., farmers' problems, factors affecting adoption of new practices, attitudes toward programs.

2. Analysis of relationships.

- a) Tabular comparisons of two or more groups (e.g., farmers with low and high incomes) to see what factors are related to success.
- b) Regression analysis of relationships between two or more variables.

The records can be for 1) certain crops only; 2) the entire crop and livestock system of a farmer; or 3) household consumption and non-farm earnings, in addition to farm activities.

In Indonesia, farm record information has been obtained from samples of farmers for use at national levels. Usually the data are collected by local extension workers at the end of cropping seasons. Sometimes farm record information is obtained through special surveys. Most of the analysis has been descriptive.

Extension programs in some countries have taught small farmers and their wives how to keep farm and household records. They have been taught also how to use these records to manage their finances and to identify causes of inefficiency. These programs have been successful even where farm families don't have much education. Maybe this could be done in Indonesia too.

**AN EXAMPLE OF DESCRIPTIVE ANALYSIS
OF FARM RECORD INFORMATION FOR A SINGLE CROP**

B3.1

Analisa Ekonomi Usahatani
dengan Penerapan Pola Tanam Setahun
Komoditi Padi sawah

Tanaman ke (Bulan Agst 1987 s/d bulan Juli 1987..
 Nama Petani :
 Status Petani : (Pemilik Penggarap / ~~Penyahap~~ / ~~Penyawa~~)^{x1} Desa : Pabean ...
 Luas yang dluasahkan : 0,30 Ha (Lahan sawah / lahan-luasaga)^{x1} WKBP : Pabean ...
 Kab. : Probolinggo
 Prop. : Jawa Tim.

Jenis pengeluaran / kegiatan	Nilai Biaya (Rp.)			
	Riel dikeluarkan (Rp. + Natura)		Diperhitungkan	
A. Nilai Sewa tanah Usahatani (yang berlaku setempat atau sekitarnya untuk sewa yang diperhitungkan.)			100.000	
B. 1. Pajak, Ipeda, luran dsb. permutim	1.920			
2. Bunga Kredit (kalau menggunakan kredit untuk				
C. Sarana Produksi, komoditi ybs. riel dikeluarkan).				
1. Bibit : 15 kg	4.500			
2. Pupuk buatan Urea / ZA ^{x1} : 90 kg	10.800			
TSP : 30 kg	3.600			
ZK/KCl ^{x1} : 10 kg	1.000			
3. Pupuk majemuk : kg				
4. Pupuk kandang / kompos : kg				
5. Racun cairan : 1,5 lt.	4.000			
padat : 4 kg	4.000			
6. Pemeliharaan rumput : lt.				
7. Lain-lain : lt.				
D. Tenaga kerja yang digunakan				
Jenis pekerjaan :	Ten. Upaha- un (HK)	Ten. Kelu- arga (HK)	Tenaga Upahan	Tenaga Keluarga
1. Penanaman : 6 3			7.800	3.900
2. Pengolahan tanah :				
-- mencangkul : 9 11.700				
-- meluku : 19,2 25.800				
-- traktor : 12 15.600				
3. Penunaman : 29 37.700				
4. Penyiangan : 3 3.900				
5. Pemupukan : 14 18.200				
6. Perlindungan tanaman : 50,1 75.600				
7. Panen (sabit / menuai) : 50,1 75.600				
8. Merontok : 50,1 75.600				
9. Membersihkan : 50,1 75.600				
10. Angkutan : 50,1 75.600				
11. Mengeringkan : 50,1 75.600				
12. Menjatkan Ose / Pipilan : 50,1 75.600				
13. Lain-lain : 50,1 75.600				
E. T O T A L			TBRD Rp 203.420	TBD Rp 126.000

- Total Biaya Produksi (TBP) = TBRD + TBD = Rp. 329.420
- Total Produksi (TP) = 2.700 kg. Bentuk hasil kg
- Harga setempat per kg. Rp. 140,=
- Nilai Total Produksi (NTP = 2 x 3) = Rp. 378.000
- Pendapatan bersih secara usahatani (NTP - TBP) = Rp. 48.580
- Pendapatan bersih petani (NTP - TBRD) = Rp. 174.580

Data source: Binus Usahatani (Food Crops Farm Economics Group), Jakarta.

AN EXAMPLE OF HOW FARM RECORDS CAN BE USED
TO COMPARE GROUPS OF FARMERS

B3.2

East Java corn, 1989, 48 farm records, 29 from Kab Lamajang & 19 from Kab Probolinggo
SOME FACTORS TABULATED ACCORDING TO YIELD LEVELS
An example of grouping by dependent variable

Characteristic	Unit of measure	Low-yield group (16 farms)	Medium-yield group (16 farms)	High-yield group (16 farms)
Ave. output (yield)	Kg/ha/farm	3,320	4,089	5,205
Ave. value of output	Rp/ha/farm	790,132	1,003,118	1,186,344
Ave. seed and fertilizer cost	Rp/ha/farm	165,562	198,991	227,563
Seed	Rp/ha/farm	66,396	73,230	75,980
Fertilizer	Rp/ha/farm	99,166	125,761	151,583
Ave. input use:				
Seed	Kg/ha/farm	29	29	29
Urea	Kg/ha/farm	522	661	726
TSP	Kg/ha/farm	59	70	134
ZK/KCL	Kg/ha/farm	0	8	47
Ave. labor used:	Days/ha/farm	122	140	125
For production	Days/ha/farm	61	72	89
For harvest & post-harvest	Days/ha/farm	61	67	37
Ave. size of farming unit	Ha/farm	0.50	0.40	0.41
Varieties used:				
Hybrid (Pioneer, C-1, etc.)	No. of farmers	8	10	5
Arjuna	No. of farmers	8	6	11
Location:				
Kabupaten Lamajang	No. of farmers	9	8	12
Kabupaten Probolinggo	No. of farmers	7	8	4

CONCLUSIONS: Higher yields are associated with (but not necessarily caused by):
 Higher value of output (obviously!)
 More labor for planting, weeding, and fertilizing
 Location (the high yields tend to be in Kab. Lumajang)
 Higher cost of seed per hectare

Yields do not appear to be related to:
 Amount of seed used per hectare
 Size of farming unit
 Use of hybrids (in fact, high yields tend to be Arjuna)

QUESTIONS FOR THOUGHT AND DISCUSSION:

1. Which of these may affect yields, and which may be merely correlated with yields?
2. Are there some other factors that may affect yields?
3. The figure for harvest/post-harvest labor is lower for the high-yield group than the other groups. How could this be?

WITH FARM RECORD DATA

East Java corn, 1989, 48 farm records
SOME FACTORS TABULATED ACCORDING TO KABUPATEN

An example of grouping by one independent variable

Characteristic	Unit of measure	Kabupaten Lamajang (29 farms)	Kabupaten Probilinggo (19 farms)
Ave. output (yield)	Kg/ha/farm	4,320	4,203
Ave. value of output	Rp/ha/farm	894,669	1,185,170
Ave. seed and fertilizer cost	Rp/ha/farm	139,102	295,026
Seed	Rp/ha/farm	67,252	82,410
Fertilizer	Rp/ha/farm	71,850	212,615
Ave. input use:			
Seed	Kg/ha/farm	29	31
Urea	Kg/ha/farm	269	1,225
TSP	Kg/ha/farm	132	24
ZK/KCL	Kg/ha/farm	29	2
Ave. labor used:	Days/ha/farm	112	161
For production	Days/ha/farm	70	84
For harvest & post-harvest	Days/ha/farm	43	77
Ave. size of farming unit	Ha/farm	0.59	0.24
Varieties used:			
Hybrid (Pioneer, C-1, etc.)	No. of farmers	4	19
Arjuna	No. of farmers	25	0

SOME CONCLUSIONS:

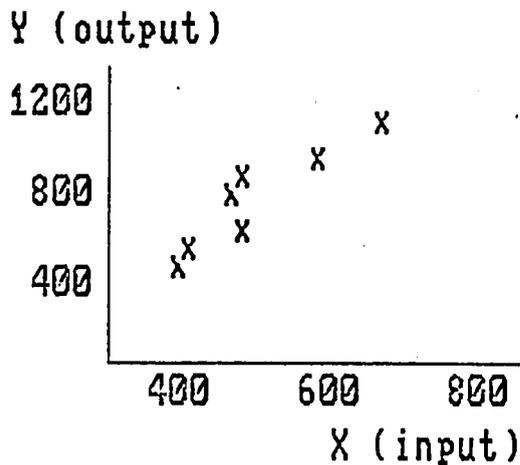
1. For this sample of farmers at least, the average corn yield is nearly the same in Kab Lamajang as in Kab Probilinggo.
2. The higher value of corn output per hectare in Kab Probilinggo must reflect higher prices per kg there.
3. In terms of seed, fertilizer, and labor inputs, corn production is considerably more intensive in Kab Probilinggo than in Kab Lamajang.

QUESTIONS FOR THOUGHT AND DISCUSSION:

1. Why is the average yield in Kab Probilinggo not higher than in Kab Lamajang, even though input use is more intensive? Poorer soils? Less water? Farmers have less management skill?
2. All the farmers in Kab Probilinggo use hybrid corn, but nearly all those in Kab Lamajang use Arjuna. Is it possible to use these data to analyze the effects of hybrid varieties on corn yields?
3. What might explain why more harvest/post-harvest labor was used per hectare in Kab Probilinggo than in Kab Lamajang?
4. The average size of corn plot is larger in Kab Lamajang than in Kab Probilinggo. Is this likely to affect relative yields?

Misalnya -- Jawa Timur, kacang tanah, m.t. 1988

Petani	Biaya/ha. (input)	Penerimaan/ha. (output)
	-- Rp. 1000 --	
1	395	400
2	470	560
3	414	450
4	447	768
5	595	940
6	478	856
7	660	1.111



Bisa memakai analisa regressi untuk menyesuaikan garis atau kurva kepada data itu.

Seringkali ada "diminishing returns".

Karena itu, harus memakai kurva fungsi non-liner, misalnya...

$$Y = a X^b \quad \text{atau} \quad Y = a + b_1 X + b_2 X^2$$

Lebih baik, memakai multiple regressi, misalnya...

Y = output total petani

X_2 = Rp. pupuk, bibit ddl

X_1 = ha. tanah

X_3 = h.k. tenaga kerja

CONTOH ANALISIS FUNGSI PRODUKSI "COBB-DOUGLAS" (2)

Dari M.S. thesis, Anwar Andi Achmad, IPB-UNHAS, 1988

DATA: Penelitian fungsi produksi usahatani kedelai di Kabupaten Bone, Sulsel.
60 orang petani sampel, 1988.

MODEL PENDUGA:

$$Y = a X_1^{b_1} X_2^{b_2} X_3^{b_3} \dots X_7^{b_7} e^{b_8 D}$$

$$\text{atau } \ln Y = \ln a + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + \dots + b_7 \ln X_7 + b_8 D$$

dimana

Y = produksi kotor (kuintal)

X₁ = luas tanam (ha)

X₅ = pupuk KCl (kg)

X₂ = bibit (kg)

X₆ = insektisida (ltr/kg)

X₃ = pupuk urea (kg)

X₇ = tenaga kerja (JKP)

X₄ = pupuk TSP (kg)

D = dummy pendidikan formal

a = intersep (konstant)

b = parameter regresi (elastisitas)

HASIL ANALISIS:

$$Y = 0.3508 X_1^{0.5539} X_4^{0.1052} X_5^{0.1253} X_7^{0.1891}$$

a) EP (elastisitas produksi) = (0.5539 + 0.1052 + 0.1253 + 0.1891) = 0.9735

Artinya: Apabila semua variabel ditambah 1%, maka produksi akan meningkat 0.97%.

b) EP (X₁) = 0.5539 ... luas ditambah 1%, produksi naik 0.55%.

c) EP (X₄) = 0.1052 ... TSP " " " " 0.11%.

d) EP (X₅) = 0.1253 ... KCl " " " " 0.13%.

e) EP (X₇) = 0.1891 ... t. kerj. " " " " 0.19%.

f) Rasio biaya marjinal dengan penerimaan marjinal tidak sama diantara variabel dan tidak bernilai 1. Hal ini berarti, petani belum mencapai keuntungan maksimum (pada kondisi sekarang).

g) Keuntungan maksimum (kondisi optimal) = Rp. 64,330 dengan menggunakan

area tanam = 0.52 ha
pupuk TSP = 68 kg
pupuk KCl = 46 kg
tenaga kerja = 189 JKP
produksi = 5.8 ku

ECONOMIC ANALYSIS OF POSSIBLE IMPROVEMENTS
IN FARMERS' FOOD-CROP PRACTICES AND SYSTEMS

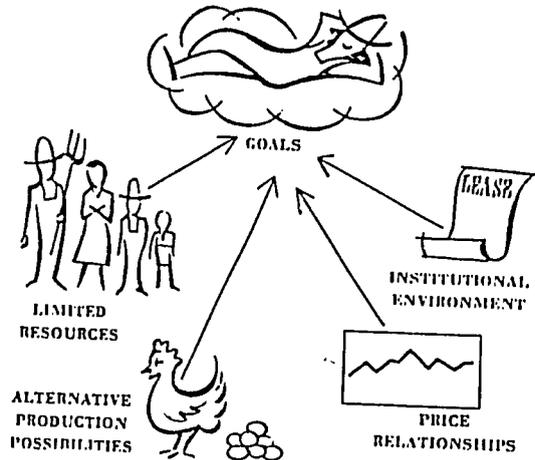
PART C

- C1. Some concepts from economics that can help to analyze farmers' food-crop potentials.
- C2. Methods of farm management analysis for evaluating proposed improvements.
- C3. How intensively to work the land? An example of incremental budgeting.
- C4. Example of whole-farm budgeting to estimate income under present farming system.
- C5. Example of whole-farm budgeting to estimate effects of major changes in cropping systems.
- C6. Simplified (non-computer) linear programming.
- C7. Sensitivity analysis to help policy decisions.
- C8. Farm management analysis to help formulate programs and projects.
- C9. Farm management analysis in extension work to help farm families make their own decisions.

SOME CONCEPTS FROM ECONOMICS THAT CAN HELP
TO ANALYZE FARMERS' FOOD-CROP POTENTIALS

C1

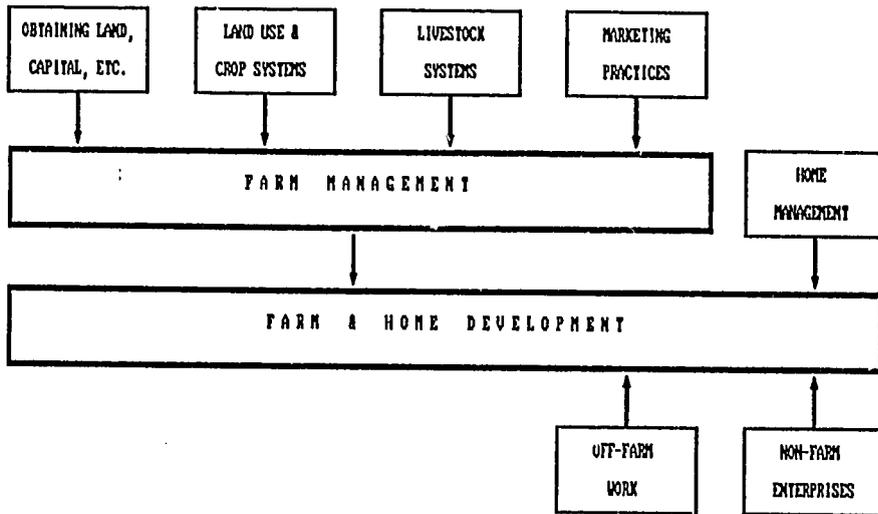
Evaluation of possible improvements in farmers' food-crop production and marketing systems can be confusing. Use of deductive logic and a diagnostic framework is helpful in 1) identifying the facts that are most relevant and 2) drawing conclusions from the facts. "Theory from production economics can be especially helpful. Some of these concepts are briefly described on the next few pages. Keep them in mind while you are using the various methods for obtaining and analyzing data related to the planning of improved food-crop systems.



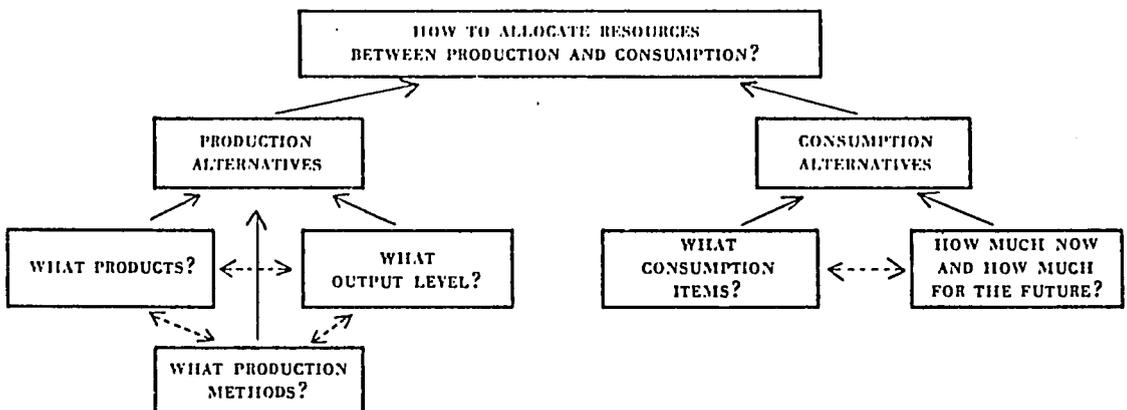
FOCUS ON THE FARM AND HOUSEHOLD
AS AN INTEGRATED DECISION UNIT

C1.1

When we try to stimulate improvements in agricultural productivity and earnings, we are not dealing just with fields, crops, and farms. We are dealing with farmers as people who are heads or members of families. On most small farms, it is difficult to separate farming operations from the household as a whole.

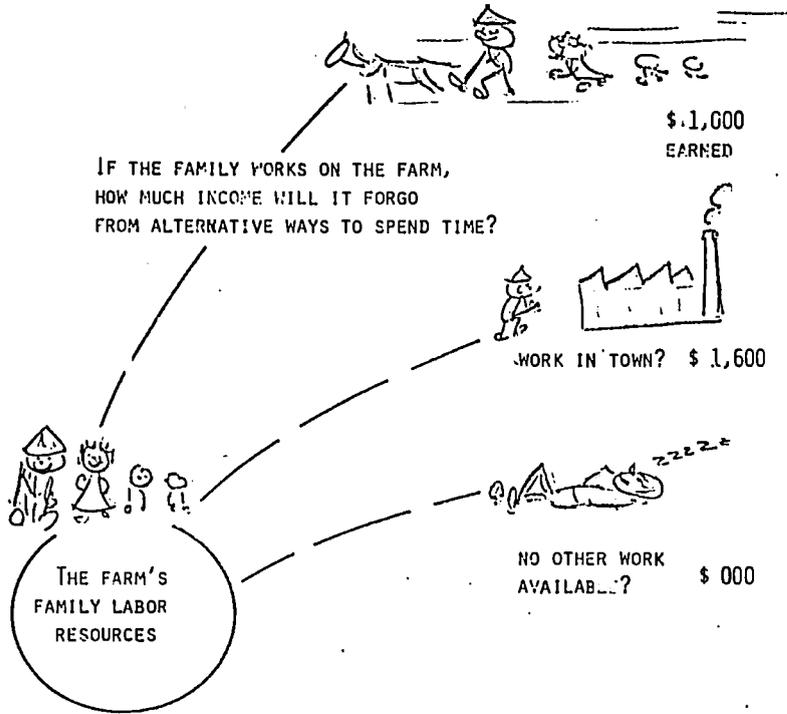


When deciding whether to make changes in their food-crop systems, such considerations as available family labor, family financial resources and needs, off-farm employment, household consumption needs, and family goals have to be taken into account.



OPPORTUNITY COST

WHEN YOU ARE DECIDING WHETHER TO USE RESOURCES FOR ONE PURPOSE, YOU NEED TO TAKE INTO ACCOUNT WHAT YOU WOULD BE GIVING UP BY NOT USING THOSE RESOURCES IN OTHER WAYS.

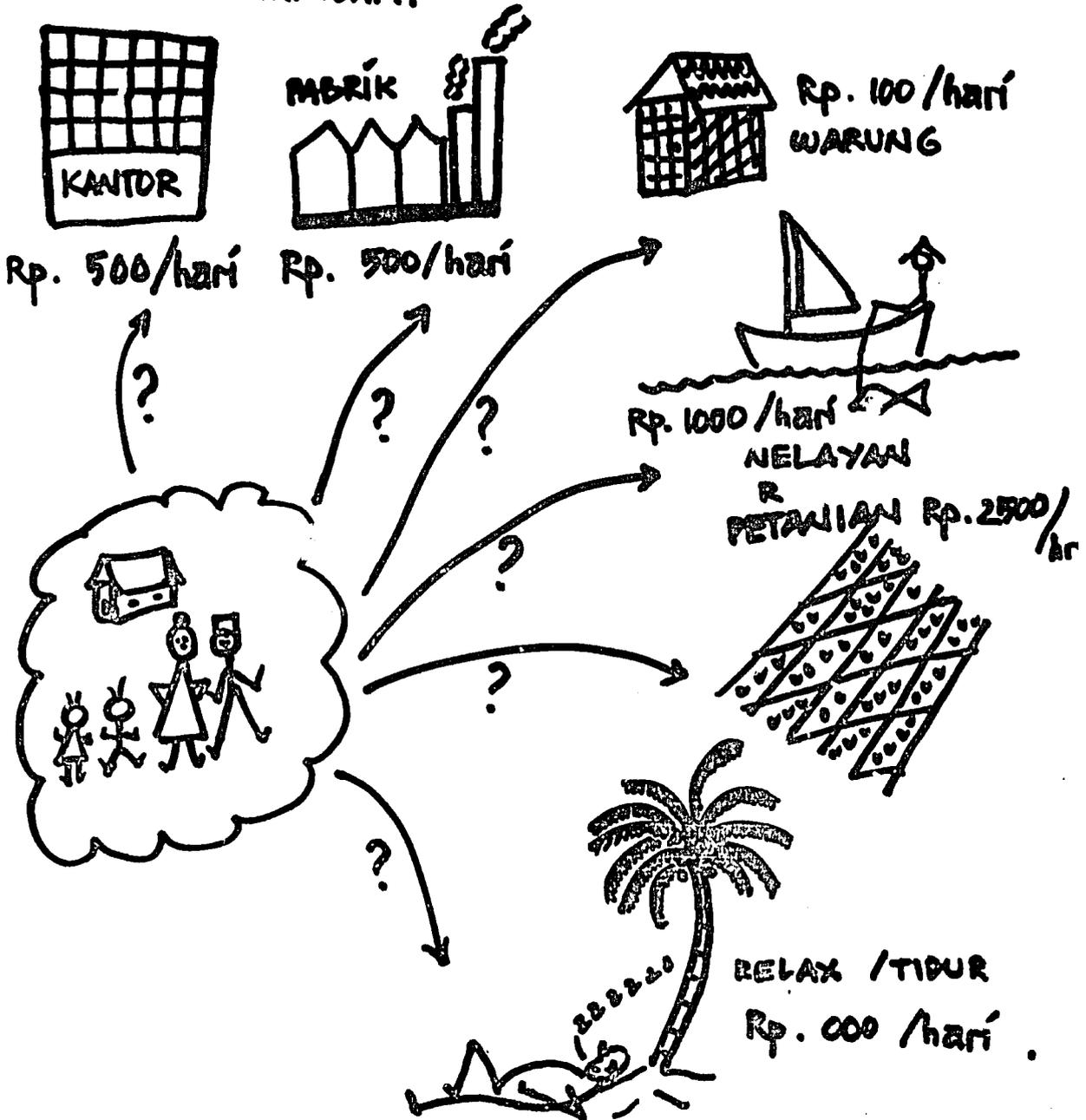


NILAI TAMBAH :

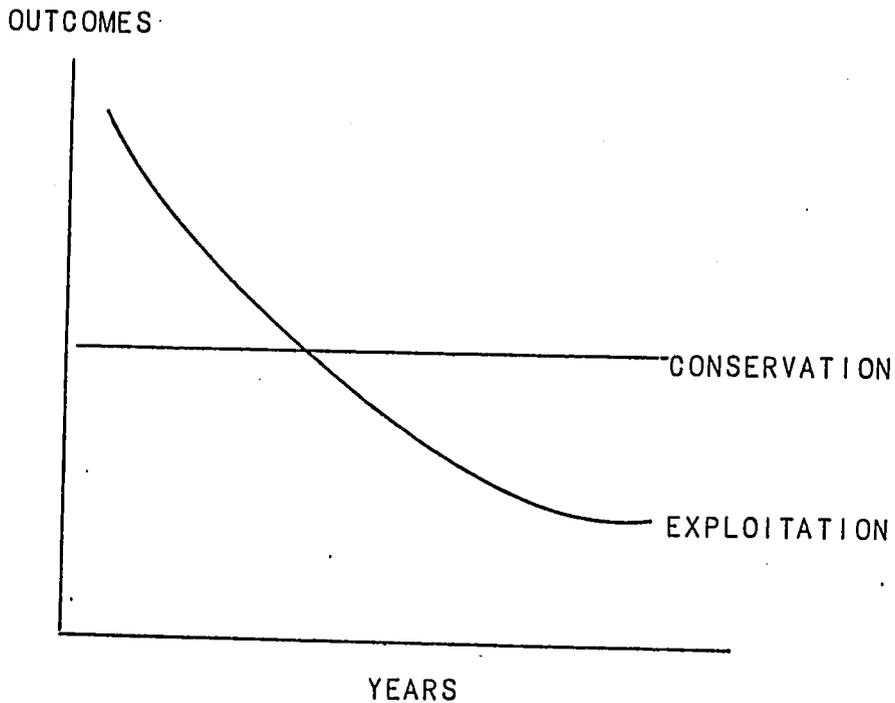
OPPORTUNITY COSTS

C1.2 Ind

DALAM MEMILIH BIDANG PEKERJAAN,
HARUS DIPERTIMBANGKAN ALTERNATIF
LAIN YANG BISA DIDAPAT SEBAGAI
NILAI TAMBAH.



Many farming decisions entail "trade-offs" between one goal and another. For example, an intensive food-crop system on hilly land may provide high yields and incomes for a few years. But there are likely to be declines in fertility and soil erosion. If the farmer follows a soil-conserving system, he may have to live on less income now, but will higher returns 5 or 10 years from now.



TRADE-OFFS

Berberapa kali, petani/pegawai mau mempertimbangkan lain faktor-faktor apalagi pendapatan kalau memilih praktek dan pola tanam.

Hal ini berkaitan dengan "trade-offs" (untung-rugi).
Misalnya:

Alternatif	Kriteria	
	Pendapatan	Jaminan makanan
A. Petani komersial	tinggi	rendah
B. Petani subsisten	rendah	tinggi

A -- lebih baik untuk pendapatan.

B -- lebih baik untuk jaminan makanan.

Penjawaban terbaik untuk satu orang/tempat mungkin tidak terbaik untuk lain orang/tempat.

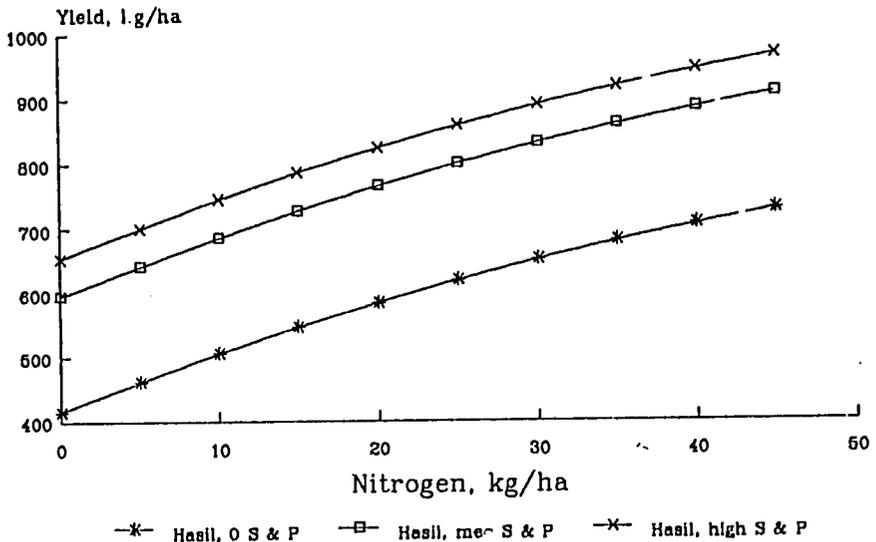
PILIHAN

BILA ADA SUATU KEMUNGKINAN YANG BAIK,
TETAPI LEBIH BURUK DARI YANG LAINNYA.

ALTERNATIF	KRITERIA	
	JANGKA PENDEK (1-4TH)	JANGKA PANJANG (5-8)
	PENDAPATAN BERSIH \bar{x}	PENDAPATAN BERSIH \bar{x}
	RP. /HA /TAHUN	
A. POLA TANAM INTENSIF	550	200
B. POLA TANAM BAIK DENGAN MEMPERHATIKAN KONSERVASI LAHAN	400	400

When a farmer intensifies his or her farming operations by applying high amounts of seed, fertilizer, and other inputs per hectare, he cannot expect yields to increase indefinitely. Limiting factors (e.g., water) will start to appear. Additional inputs do not increase yields so much as at first. This can be shown graphically as a production function:

Kedelai Yield Response to Nitro Bulukumba, Sulsel, Maros/SFCDP, 1987-88

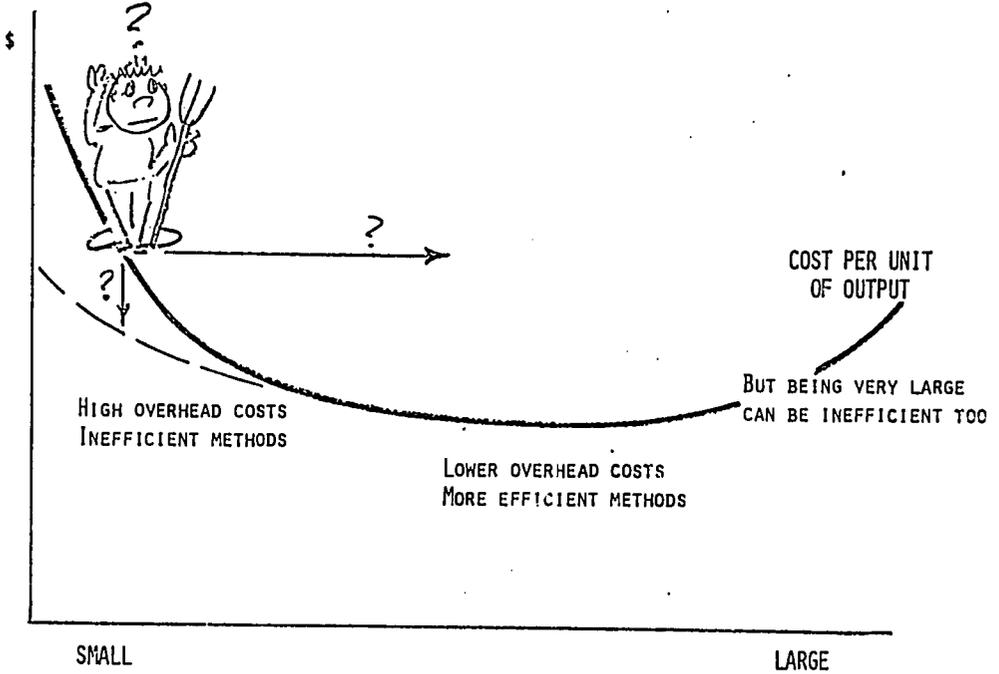


S=sulfur P=phosphate

It will pay a farmer to buy additional inputs so long as 1) the added cost is less than the added returns, and 2) those added returns are greater than from other ways in which the farmer could use that money.

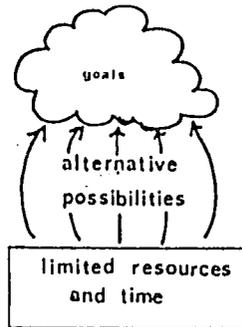
ECONOMIES OF SIZE

IF YOU'RE SMALL, ARE THERE WAYS TO REDUCE COSTS?



THE CHALLENGE OF ALLOCATING LIMITED RESOURCES C1.6
TO MAXIMIZE ACHIEVEMENT OF
THE FARM FAMILY'S GOALS

Farm families have only limited land, water, labor, and capital resources. They can use these resources in a number of ways, on the farm, in the household, and in non-farm activities. They encounter some constraints that restrict the alternatives that they can consider or reduce the returns to them (e.g., irrigation regulations). They will try to use their limited resources in a way that maximizes progress toward their family goals.



These goals will differ from family to family, and from time to time during the family's life cycle. Farm households who have very limited resources and non-irrigated land, may be most concerned with maximizing financial security and minimizing risks. They have to worry about feeding their family this season and cannot think about long-run improvements. In contrast, farm families with more resources can probably take more risks and make long-term investments that lead to maximum profits.

The use of farming resources that maximizes achievement of an individual family's goals may or may not be consistent with national development goals and targets. For example, the government may want to stimulate more production of soybeans, but soybeans may be unprofitable or too risky for some farmers. It is important to envision these farmers' situations and to analyze whether they are likely to grow soybeans even if some incentives (e.g., seed subsidies, stabilized prices) are provided.

Farming is a very risky occupation. A farmer always faces the danger of bad weather or insect infestations causing low yields. The prices of many food crops change greatly from year to year, and they are hard to predict. If the farmer rents land, he/she may not be certain that the land owner will let him use the land next year. Sometimes it is difficult to know whether assistance that has been promised by the government (e.g., subsidized seed, fertilizer, or credit) will in fact be available in time for the crop season.

There are a number of things that a farmer can do to help guard against these risks:

- ** Choose crops that are drought or pest resistant.
- ** Choose crops that have relatively stable prices.
- ** Obtain a water pump so that he can irrigate if necessary.
- ** Use integrated pest management, in which there is careful monitoring of insect and disease infestations before they become serious problems.
- ** Diversify -- produce two or more kinds of crops instead of specializing in one ...supplement earnings with livestock or non-farm jobs ...have fields in more than one location.
- ** Add storage facilities, so that there is some flexibility about when to sell the crop.
- ** Use market and price-outlook information to help decide what crops to produce and when/where to sell.
- ** Enter into contracts with buyers or processors that guarantee a certain minimum income.

However, risk protection has its costs. A fixed-price contract may mean sacrificing income if the crop price is high that season. Producing a several crops on a small scale may be less efficient than specializing in one. The farmer faces a "trade-off". He/she has to weigh the benefits of reduced risk against the earnings that may be foregone if nothing bad happens.

METHODS OF FARM MANAGEMENT ANALYSIS
FOR EVALUATING PROPOSED IMPROVEMENTS

C2

Farmers, extension workers, or program officials will not accept a new food-crop practice or system on the basis of theory alone. They want to see facts about what the benefits and costs are likely to be. They want to calculate what the effects would be on the particular farms that they are dealing with.

On the next several pages are some farm management "tools" that have been found to be useful when analyzing production and marketing alternatives on small farms. It is best to use computers for one or two of these, but most of the methods require simple arithmetic only. All of these are "simulation" methods: estimates are made of what is likely to happen. They all make use of information from several sources. They all build upon a similar series of steps:

1. Describe the farm situation that you are dealing with (or the assumptions that you are making about a typical farm) -- particularly the resource constraints (land, water, labor, capital) that have to be assumed. Farm records and survey data may help.
2. Identify the proposed changes that you want to analyze and the criteria (net income and maybe other considerations) that you will use for evaluating these changes.
3. For each change being considered, make realistic estimates of required inputs and likely outputs (yields and other effects).
4. Predict likely prices of these inputs and outputs.
5. Use these estimates to draw conclusions about the net effects of each alternative on incomes and other criteria being used.

HOW INTENSIVELY TO WORK THE LAND?
AN EXAMPLE OF INCREMENTAL BUDGETING

C3

This illustrates a method for comparing alternative levels of intensity in crop production practices. Predictions of the added costs and returns are brought together in the form of an incremental budget. In this case, improved soybean practices are predicted to result in high returns to the added labor involved.

Table 1 Magnitude of soybean yield returns in lowland Java with various production methods.

Production Method	Yield Range (t/ha)	Incremental Labour Inputs (man-day/ha)	Incremental Labour Costs (Rp/ha)	Net Return to Incremental Labour ^{b,c}
1. Present farmers' practice - minimum tillage - unimproved seed - broadcasting - no drains - flood irrigation.	0.8 - 0.8		man-day	
2. Slightly improved farmers' practice - some drains - improved seed and planting methods - flood irrigation	0.9 - 1.3	20	36,000	224,000
3. Improved cultural practices ^a - the best variety available - drainage/irrigation furrows spaced about 3 m - partially controlled irrigation	1.5 - 2.3	25 9	60,000	840,000
4. Optimal cultural practices ^a with optimal irrigation methods - the best variety available - drainage/irrigation furrows correctly spaced - correct irrigation method with regulated supply and drainage	2.0 - 3.0	30 10	72,000	1,260,000

^aAssumes optimum time of planting; fertilizer application of about 45 kg/ha P₂O₅ + *Rhizobium* inoculation; and adequate pest and disease control.

^bBased on a labour cost of Rp 1,800/day and a soybean farm gate price of Rp 650 - 750/kg.

^cIncremental inputs are not considered but they are relatively small.

Why haven't many farmers adopted these improved practices yet? Maybe it is because they don't know how to handle these practices? Or because their irrigation systems don't fit the needs of soybeans? Or because their money and labor can be used more profitably in other ways? We need to have more information about specific farming situations before we can answer such questions.

Source: William C. Beets, "How to achieve a yield breakthrough in lowland legume production", CGPRT Centre Palawija News, March 1989, page 8.

EXAMPLE OF WHOLE-FARM BUDGETING
TO ESTIMATE INCOME UNDER PRESENT FARMING SYSTEM
 ANALISA USAHA TANI
 ALTERNATIF A1

C4

Situasi:

1. Pola tanam setahun tradisional : Padi - Bero ('1kali setahun)
2. Lahan sawah milik sendiri, dengan luas 0.65 hektar
3. Jenis lahan sawah tadah hujan
4. Pemilikan lahan pekarangan seluas 0.2 hektar
ditanami kelapa, pisang, dll
5. Pemilikan sarana usaha tani :
 - a. Ternak sapi 2 ekor
 - b. Perontok 1 buah

Model analisa usaha taninya sbb:
 dengan luas lahan = 0.65 ha

NO	KOMPONEN ANALISA	Padi (Musim Tanam I)			Jumlah hasil selama 1 tahun (Rupiah)
		volume per ha	volume per luas pemilikan (Rp)	harga (Rp)	
I	BIAYA PRODUKSI				
	1. Pupuk Urea	200 kg	130 kg	165	21450
	TSP	100 kg	65 kg	165	10725
	KCL	0 kg	0 kg	0	0
	ZA	0 kg	0 kg	0	0
	2. Pestisida:				
	a. Cair	2 LT	1 LT	1500	1950
	b. Granula	17 Kg	11 Kg	600	6630
	3. Seed treatment	0 TH	0 TH	0	0
	4. Benih	0 Kg	0 Kg	0	0
	5. Tenaga Upah :				
	a. Persemaian dan Pengolahan lahan	0 HK	0 kg	0	0
	b. Tanam&Pemeliharaan	^ kg	0 kg	200	0
	c. Panen&pasca panen	650 kg	423 kg	200	84500
	6. a. Penyusutan alat	0 TH	0 TH	0	0
	b. Fajak	0.50 TH	0 TH	3000	975
	7. Sewa :				
	a. Tanah	0 TH	0 TH	0	0
	b. Peralatan	4 K1	3 K1	1500	3900
	TOTAL BIAYA PROD.			130130	130130
II	HSL PRODUKSI (OUTPUT)				
	a. Hsl total	6500 Kg	4225 Kg	200	845000
	b. untuk konsumsi	3250 Kg	2113 Kg	200	422500
	c. untuk benih	25 Kg	16 Kg	200	3250
	d. hsl. prod. brsh(a-b-c)	3225 Kg	2096 Kg	200	419250
III	TAMBAHAN HASIL				
	a. Tanaman rambutan			0	0
	b. Kelapa			0	0
IV.	PENDAPATAN				
	a. Pendapatan Kotor	-	-	-	419250
	b. Pendapatan Bersih	-	-	-	289120

- 11

ANALISA USAHA TANI
 ALTERNATIF A2

WHOLE FARM BUDGETING OF CHANGES IN CROPS

C5.1

Situasi:

1. Pola tanam setahun tradisional : Padi - Jagung - Bero ('Ikali setahun)
2. Lahan sawah milik sendiri, dengan luas 0.65 hektar
3. Jenis lahan sawah tadah hujan
4. Pemilikan lahan pekarangan seluas 0.2 hektar
ditanami kelapa, pisang, dll
5. Pemilikan sarana usaha tani :
 - a. Ternak sapi 2 ekor
 - b. Perontok 1 buah

Model analisa usaha taninya sbb:
 dengan luas lahan = 0.65 ha

NO	KOMPONEN ANALISA	Padi (Musim Tanam I)			Jagung (Musim Tanam ke II)			B e r o			Jumlah hasil selama 1 tahun (Rupiah)		
		volume per ha	volume per luas penanaman (Rp)	harga hasil (Rp)	volume per ha	volume per luas penanaman (Rp)	harga hasil (Rp)	volume per ha	volume per luas penanaman (Rp)	harga hasil (Rp)			
I	BIAYA PRODUKSI												
	1. Pupuk Urea	200 kg	130 kg	165	21450	160 kg	65 kg	165	10725	0 kg	0 kg	0	32175
	TSP	100 kg	65 kg	165	10725	150 kg	98 kg	165	16088	0 kg	0 kg	0	26813
	KCL	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0
	ZA	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0
	2. Pestisida:												
	a. Cair	2 LT	1 LI	1500	1950	2 LT	1 LI	1500	1950	0 LT	0 LI	0	3900
	b. Granula	17 Kg	11 Kg	690	6630	0 Kg	0 Kg	0	0	0 Kg	0 Kg	0	6630
	3. Seed treatment	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0
	4. Benih	0 Kg	0 Kg	0	0	0 Kg	0 Kg	0	0	0 Kg	0 Kg	0	0
	5. Tenaga Upah :												
	a. Persiapan dan Pengolahan lahan	0 HK	0 kg	0	0	0 HK	0 kg	0	0	0 HK	0 kg	0	0
	b. Tanam & Pemeliharaan	0 kg	0 kg	200	0	0 kg	0 kg	150	0	0 kg	0 kg	0	0
	c. Panen & pasca panen	650 kg	423 kg	200	84500	358 kg	232 kg	150	34856	0 HK	0 HK	0	119356
	6. a. Penyusutan alat	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0
	b. Pajak	0.50 TH	0 TH	3000	975	0.50 TH	0 TH	3000	975	0 TH	0 TH	0	1950
	7. Sewa :												
	a. Tanah	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0
	b. Peralatan	4 Kl	3 Kl	1500	3900	3 Kl	2 Kl	1500	2925	0 TH	0 TH	0	6825
	TOTAL BIAYA PROD.				130130				67519			0	197649
II	HEL PRODUKSI (OUTPUT)												
	a. Hsl total	6500 kg	4225 Kg	200	845000	3575 Kg	2324 Kg	150	348563	0 Kg	0 Kg	0	1193563
	b. untuk konsumsi	3250 kg	2113 Kg	200	422500	0 Kg	0 Kg	150	0	0 Kg	0 Kg	0	422500
	c. untuk benih	25 kg	16 Kg	200	3250	40 Kg	26 Kg	150	3900	0 Kg	0 Kg	0	7150
	d. hsl. prod. brsh(a-b-c)	3225 kg	2096 Kg	200	419250	3535 Kg	2298 Kg	150	344663	0 Kg	0 Kg	0	763913
III	TAMBAHAN HASIL												
	a. Tanaman raebutan :			0	0				0			0	0
	b. Kelapa			0	0				0			0	0
IV	PENDAPATAN												
	a. Pendapatan Kotor	-	-	-	419250	-	-	-	344663	-	-	-	763913
	b. Pendapatan Bersih	-	-	-	289120	-	-	-	277144	-	-	-	566264
VII	PERUBAHAN BIAYA				67519				0				
VIII	PERUBAHAN PENDAPATAN				277144				0				

ANALISA USAHA TANI
ALTERNATIF A3

C5.2

Situasi:

1. Pola lahan setahun tradisional : Padi - Kedele - Bero ('ikali setahun)
2. Lahan sawah milik sendiri, dengan luas 0.65 hektar
3. Jenis lahan sawah tadah hujan
4. Pemilikan lahan pekarangan seluas 0.2 hektar ditanami kelapa, pisang, dll
5. Pemilikan sarana usaha tani :
 - a. Ternak sapi 2 ekor
 - b. Perontok 1 buah

Model analisa usaha taninya sbb:
dengan luas lahan = 0.65 ha

NO	KOMPONEN ANALISA	Padi (Musim Tanam I)				Kedele (Musim Tanam ke II)				B e r o '				Jumlah hasil selama 1 tahun (Rupiah)
		volume per ha	volume per luas peilikan (Rp)	harga	Jumlah hasil (Rp)	volume per ha	volume per luas peilikan(Rp)	harga	Jumlah hasil (Rp)	volume per ha	volume per luas harga peilikan(Rp)	harga	Jumlah hasil (Rp)	
I	BIAYA PRODUKSI													
	1. Pupuk Urea	200 kg	130 kg	165	21450	40 kg	26 kg	165	4290	0 kg	0 kg	0	0	25740
	TSP	100 kg	65 kg	165	10725	50 kg	33 kg	165	5363	0 kg	0 kg	0	0	16088
	KDL	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0
	ZA	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0
	2. Pestisida:													
	a. Cair	2 LT	1 LT	1500	1950	2 LT	1 LT	1000	1300	0 LT	0 LT	0	0	0
	b. Granula	17 Kg	11 kg	600	6630	1 Kg	1 Kg	750	488	0 Kg	0 Kg	0	0	3250
	3. Seed treatment	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	7118
	4. Benih	0 Kg	0 Kg	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0
	5. Tenaga Upah :													
	a. Persemaian dan Pengolahan lahan	0 HK	0 HK	0	0	5 HK	3 HK	2000	6500	0 HK	0 kg	0	0	22750
	b. Tanasifeelihararaan	0 kg	0 kg	200	0	10 HK	7 HK	575	3738	0 kg	0 kg	0	0	6500
	c. Panen/pasca panen	650 kg	423 kg	200	34500	130 kg	65 kg	575	48588	0 HK	0 HK	0	0	3738
	6. a. Penyusutan alat	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	133088
	b. Pajak	0.50 TH	0 TH	3000	975	0.50 TH	0 TH	3000	975	0 TH	0 TH	0	0	0
	7. Sewa :													
	a. Tanah	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	1950
	b. Peralatan	4 KI	3 KI	1500	3900	4 KI	3 KI	1500	3900	0 TH	0 TH	0	0	0
	TOTAL BIAYA PROD.				130130				57890				0	7800
II	HSL PRODUKSI (OUTPUT)													226020
	a. Hsl total	6500 Kg	4225 Kg	200	845000	1300 Kg	845 Kg	575	485875	0 Kg	0 Kg	0	0	1330875
	b. untuk konsumsi	3250 Kg	2113 Kg	200	422500	0 Kg	0 Kg	575	0	0 Kg	0 Kg	0	0	422500
	c. untuk benih	25 Kg	16 Kg	200	3250	0 Kg	0 Kg	575	0	0 Kg	0 Kg	0	0	3250
	d. hsl. prod. brsh(a-b-c)	3225 Kg	2096 Kg	200	419250	1300 kg	845 Kg	575	485875	0 Kg	0 Kg	0	0	905125
III	TAMBAHAN HASIL													
	a. Tanaman raabutan				0				0				0	0
	b. Kelapa				0				0				0	0
IV.	PENDAPATAN													
	a. Pendapatan Kotor	-	-	-	419250	-	-	-	485875	-	-	-	0	905125
	b. Pendapatan Bersih	-	-	-	269120	-	-	-	387985	-	-	-	0	677105
VII	PERUBAHAN BIAYA				97890				0					
VIII	PERUBAHAN PENDAPATAN				387985				0					

ANALISA USAHA TANI
ALTERNATIF A4

C5.3

Situasi:

1. Pola tanam setahun tradisional : Padi - Kedele - Bero (1kali setahun)
2. Lahan sawah menyewa dengan luas 0,65 hektar
3. Jenis lahan sawah tadah bujan
4. Peailikan lahan pekarangan seluas 0.2 hektar dilayani kelapa, pisang, dll
5. Penilikan sarana usaha tani :
 - a. Ternak sapi 2 ekor
 - b. Perontok 1 buah

Model analisa usaha taninya sbbs:
dengan luas lahan = 0,65 ha

NO	KOMPONEN ANALISA	Padi (Musim Tanam I)				Kedele (Musim Tanam ke II)				B e r o			Jumlah hasil selama 1 tahun (Rupiah)	
		volume per ha	volume per luas peailikan	harga (Rp)	Jumlah hasil (Rp)	volume per ha	volume per luas peailikan(Rp)	harga (Rp)	Jumlah hasil (Rp)	volume per ha	volume per luas peailikan(Rp)	Jumlah hasil (Rp)		
I	BIAYA PRODUKSI													
	1. Pupuk Urea	200 kg	130 kg	165	21450	40 kg	26 kg	165	4290	0 kg	0 kg	0	0	25740
	TSP	100 kg	65 kg	165	10725	50 kg	33 kg	165	5363	0 kg	0 kg	0	0	16088
	KCL	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0
	Zn	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0 kg	0 kg	0	0	0
	2. Pestisida:													
	a. Cair	2 LT	1 LT	1500	1950	2 LT	1 LT	1000	1300	0 LT	0 LT	0	0	3250
	b. Granula	17 kg	11 kg	600	6630	1 kg	1 kg	750	488	0 kg	0 kg	0	0	7118
	3. Seed treatant	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0
	3. Benih	25 kg	16 kg	300	4875	50 kg	33 kg	700	22750	0 kg	0 kg	0	0	27625
	5. Tenaga Upah :													
	a. Persewaan dan Pengolahan lahan	0 HK	0 HK	0	0	5 HK	3 HK	2000	6500	0 HK	0 kg	0	0	6500
	b. Tanam & Pemeliharaan	0 kg	0 kg	200	0	10 HK	7 HK	575	3738	0 kg	0 kg	0	0	3738
	c. Panen & pasca panen	650 kg	423 kg	200	84500	130 kg	85 kg	575	48588	0 HK	0 HK	0	0	133088
	6. a. Penyusutan alat	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0
	b. Pajak	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0 TH	0 TH	0	0	0
	7. Sewa :													
	a. Tanah	1 MT	0.65 MT	125000	81250	1 MT	0.65 MT	80000	52000	0 TH	0 TH	0	0	133250
	b. Peralatan	4 KL	3 KL	1500	3900	4 KL	3 KL	1500	3900	0 TH	0 TH	0	0	7800
	TOTAL BIAYA PROD.				215280				148915				0	364195
II	HSL PRODUKSI (OUTPUT)													
	a. Hsl total	6500 kg	4225 kg	200	845900	1300 kg	845 kg	575	485875	0 kg	0 kg	0	0	1333875
	b. untuk konsumsi	3250 kg	2113 kg	200	422500	0 kg	0 kg	575	0	0 kg	0 kg	0	0	422500
	c. untuk benih	0 kg	0 kg	200	0	0 kg	0 kg	575	0	0 kg	0 kg	0	0	0
	d. hsl. prod. brsh(a-b-c)	3250 kg	2113 kg	200	422500	1300 kg	845 kg	575	485875	0 kg	0 kg	0	0	908375
III	TAMBAHAN HASIL													
	a. Tanaman rasbutan				0				0				0	0
	b. Kelapa				0				0				0	0
IV.	PENDAPATAN													
	a. Pendapatan kotor	-	-	-	422500	-	-	-	485875	-	-	-	0	908375
	b. Pendapatan Bersih	-	-	-	207220	-	-	-	336960	-	-	-	0	544180
VII	PERUBAHAN BIAYA				148915				0					
VIII	PERUBAHAN PENDAPATAN				336960				0					

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SIMPLIFIED (NON-COMPUTER) LINEAR PROGRAMMING

C6.1

This is a "systems method" for determining the combination of farming enterprises that will utilize farmers' limited resources to the fullest extent.

STEP 1. Identify the alternatives to be considered.

Activity
A. Padi gogo
B. Jagung traditional
C. Jagung hibrida
D. Kedele
E. Kacang tanah
F. Kacang hijau

STEP 2. Estimate the gross margin (returns - variable costs) per hectare for each alternative.

Activity	: Gross : margin :Rp1000/ha:	:Derived from: :value of output :minus variable cash costs
A. Padi gogo	320	:427 - 107
B. Jagung traditional	335	:391 - 56
C. Jagung hibrida	430	:531 - 161
D. Kedele	275	:489 - 214
E. Kacang tanah	350	:427 - 77
F. Kacang hijau	375	:422 - 47

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STEP 3. Identify the farmer's most important resource constraints and determine how much of each resource is available.

Activity	Gross margin :Rp1000/ha:	Land Ha	Labor Month 1 Man-days	Labor Month 2 Man-days	Labor Month 3 Man-days	Funds Rp1000
		0.8	75	75	75	120
A. Padi gogo	320					
B. Jagung traditional	335					
C. Jagung hibrida	430					
D. Kedele	275					
E. Kacang tanah	350					
F. Kacang hijau	375					

STEP 4. Estimate the amount of each resource that would be needed to produce 1 Ha of each alternative enterprise.

Activity	Gross margin :Rp1000/ha:	Land Ha	Labor Month 1 Man-days	Labor Month 2 Man-days	Labor Month 3 Man-days	Funds Rp1000
		0.8	75	75	75	120
A. Padi gogo	320	1	39	41	48	107
B. Jagung traditional	335	1	41	33	39	56
C. Jagung hibrida	430	1	110	37	66	161
D. Kedele	275	1	74	135	29	214
E. Kacang tanah	350	1	60	40	25	77
F. Kacang hijau	375	1	48	34	25	47

STEP 5. Determine the maximum number of hectares that could be produced when constrained by a particular resource.

C6.3

Activity	Gross margin :Rp1000/ha:	Land Ha	Labor Month 1 Man-days	Labor Month 2 Man-days	Labor Month 3 Man-days	Funds Rp1000
		0.8	75	75	75	120
A. Padi gogo	320	1	39	41	48	107
		0.80	1.92	1.83	1.56	1.12 **
B. Jagung tradisional	335	1	41	33	39	56
		0.80	1.83	2.27	1.92	2.14
C. Jagung hibrida	430	1	110	37	66	161
		0.80	0.68	2.03	1.14	0.75
D. Kedelai	275	1	74	135	29	214
		0.80	1.01	0.56	2.59	0.56
E. Kacang tanah	350	1	60	40	25	77
		0.80	1.25	1.88	3.00	1.56
F. Kacang hijau	375	1	48	34	25	47
		0.80	1.56	2.21	3.00	2.55

** 0.8/1; 75/39; 75/41; etc.

STEP 6. Eliminate from consideration any activities and resource constraints that clearly will not affect the answer.

Can eliminate E (kacang tanah) because it is clearly inferior to F (kacang hijau). E's gross margin is lower, and it uses the same or more inputs per ha.

Can other activities or constraints be eliminated?

STEP 7. Calculate the gross margins per unit of resource requirement, and rank the activities according to this.

C6.4

Activity	Land Ha	Labor Month 1 Man-days	Labor Month 2 Man-days	Labor Month 3 Man-days	Funds Rp1000
Gross margin per	ha	man-day	man-day	man-day	Rp1000
A. Padi gogo	320.0 4	8.2 1	7.8 4	6.7 4	3.0 ** 3
B. Jagung tradisional	335.0 3	8.2 1	10.2 3	8.6 3	6.0 2
C. Jagung hibrida	430.0 1	3.9 3	11.6 1	6.5 5	2.7 4
D. Kedele	275.0 5	3.7 4	2.0 5	9.5 2	1.3 5
F. Kacang hijau	375.0 2	7.8 2	11.0 2	15.0 1	8.0 1

** 320/1; 320/39; 320/41; etc.

• Column rank: 1 = highest ... 5 = lowest

STEP 8. Preliminary activity selection:

Choose an activity that has a high gross margin with respect to one of the most constraining resources.

For the largest amount of that activity which is possible, calculate the gross margin and resource requirements.

Sometimes it will be obvious that two or more activities fit in well. If so, combine them in the preliminary selection and calculations.

	Gross margin Rp1000,	Land Ha	Labor Month 1 Man-days	Labor Month 2 Man-days	Labor Month 3 Man-days	Funds Rp1000
Beginning amount	0	0.8	75	75	75	120
Jagung hibrida: high return per ha land try up to .68 ha limit	292.4	-0.68	-74.8	-25.2	-44.9	-109.5
Balanca	292.4	0.12	0.2	49.84	30.12	10.52

STEP 9. Substitute one or more activities that would help to use resources more fully and perhaps increase total returns.

C6.5

Look first at additional activities that give high returns to the resources which are most constraining.

Some trial and error will probably be needed before arriving at the combination of activities that gives highest gross margin.

	: Gross : margin :Rp1000	: Land : Ha	: Labor Month 1 Man-days	: Labor Month 2 Man-days	: Labor Month 3 Man-days	: Funds Rp1000
Beginning amount	0	0.8	75	75	75	120
Jagung hibrida: high return per ha land try up to .68 ha limit	292.40	-0.68	-74.80	-25.16	-44.88	-109.48
Balance	292.40	0.12	0.20	49.84	30.12	10.52
Reduce jagung hibrida by .20 ha	-86.00	0.20	22.00	7.40	13.20	32.20
Balance	206.40	0.32	22.20	57.24	43.32	42.72
Add .32 ha kacang hijau	120.00	-0.32	-15.36	-10.88	-8.00	-15.04
Balance	326.40	0.00	6.84	46.36	35.32	27.68

[Sam Pakdahan (Binus/Usanatani) and David Brown (SFCDP/USAID), September 1989.
Method adapted from: FAO 'Farm Management Research for Small Farmer Development',
1984, pp. 63-66.]

LINEAR PROGRAMMING YANG DISEDERHANAKAN

C6.1 Ind

Metode sistem ini adalah untuk mendeterminasi kombinasi perusahaan pertanian (usahatani) yang menggunakan sumber-sumber petani yang terbatas sampai kepada suatu kenyataan yang paling optimum.

LANGKAH 1. Hal-hal yang diperhatikan dalam identifikasi alternatif-alternatif

Kegiatan
A. Padi gogo
B. Jagung tradisional
C. Jagung hibrida
D. Kedele
E. Kacang tanah
F. Kacang hijau

LANGKAH 2. Perkirakan (hitung) pendapatan (penerimaan - biaya-biaya variabel) per Ha untuk setiap alternatif.

Kegiatan	: Pen- : dapatan :Rp1000/Ha:	: Didapatkan dari: : Nilai output : dikurangi biaya-biaya variabel
A. Padi gogo	320	:427 - 107
B. Jagung tradisional	335	:391 - 55
C. Jagung hibrida	430	:531 - 161
D. Kedele	275	:489 - 214
E. Kacang tanah	350	:427 - 77
F. Kacang hijau	375	:422 - 47

LANGKAH 3. Tentukan (identifisir) sumber yang menjadi konstrain (hambatan) yang paling penting dari petani dan tentukan berapa banyak dari masing sumber itu yang tersedia.

C6.2 Ind

Kegiatan	Pen- dapatan :Rp1000/Ha:	Tanah Ha	Buruh Bulan 1 HOK	Buruh Bulan 2 HOK	Buruh Bulan 3 HOK	Dana Rp1000
		0.8	75	75	75	120
A. Padi gogo	320					
B. Jagung traditional	335					
C. Jagung hibrida	430					
D. Kedele	275					
E. Kacang tanah	350					
F. Kacang hijau	375					

LANGKAH 4. Hitung (perkirakan) jumlah dari masing-masing sumber yang dibutuhkan untuk menghasilkan dari 1 Ha untuk setiap alternatif perusahaan (usaha tani komoditi tanaman pangan).

Kegiatan	Pen- dapatan :Rp1000/Ha:	Tanah Ha	Buruh Bulan 1 HOK	Buruh Bulan 2 HOK	Buruh Bulan 3 HOK	Dana Rp1000
		0.8	75	75	75	120
A. Padi gogo	320	1	35	41	48	107
B. Jagung traditional	335	1	41	33	39	56
C. Jagung hibrida	430	1	110	37	66	161
D. Kedele	275	1	74	135	29	214
E. Kacang tanah	350	1	60	40	25	77
F. Kacang hijau	375	1	48	34	25	47

LANGKAH 5. Tentukan jumlah yang maksimum dari luasan (hektarnya) yang dapat diproduksi bila merupakan konstrain oleh sesuatu sumber.

Kegiatan	Pen- dapatan :Rp1000/Ha:	Tanah Ha	Buruh Bulan 1 HOK	Buruh Bulan 2 HOK	Buruh Bulan 3 HOK	Dana Rp1000
		0.8	75	75	75	120
A. Padi gogo	320	1	39	41	48	107
		0.80	1.92	1.83	1.56	1.12 **
B. Jagung tradisional	335	1	41	33	39	56
		0.80	1.93	2.27	1.92	2.14
C. Jagung hibrida	430	1	110	37	66	161
		0.80	0.58	2.03	1.14	0.75
D. Kedele	275	1	74	135	29	214
		0.80	1.01	0.56	2.59	0.56
E. Kacang tanah	350	1	60	40	25	77
		0.80	1.25	1.88	3.00	1.56
F. Kacang hijau	375	1	43	34	25	47
		0.80	1.56	2.21	3.00	1.55

** 0.3/1; 75/39; 75/41; dll.

LANGKAH 6. Hilangkan dari pertimbangan sesuatu kegiatan dan sumber yang menjadi konstrain yang secara jelas tidak akan memengaruhi jawaban.

E (kacang tanah) dapat dibatalkan kerana kurang baik dibandingkan F (kacang hijau). Pendapatan dari E lebih kecil dari pada F, dan memerlukan tambahan input-input.

Di antara kegiatan dan konstrain di atas, apakah masih ada yang dapat dibuang?

LANGKAH 7. Hitung pendapatan per unit dari sumber yang dibutuhkan, dan urutkan (ranking) kegiatan-kegiatan yang sesuai dengan ini.

Kegiatan	:	:	Buruh			Dana	
			Tanah	Bulan 1	Bulan 2		Bulan 3
Pendapatan per	:	:	Ha	HOK	HOK	HOK	Rp1000
A. Padi gogo	:	:	320.0	8.2	7.8	6.7	3.0 **
	:	:	4	1	4	4	3
B. Jagung tradisional	:	:	335.0	8.2	10.2	8.6	6.0
	:	:	3	1	3	3	2
C. Jagung hibrida	:	:	430.0	3.9	11.6	6.5	2.7
	:	:	1	3	1	5	4
D. Kedele	:	:	275.0	3.7	2.0	9.5	1.3
	:	:	5	4	5	2	5
F. Kacang hijau	:	:	375.0	7.3	11.0	15.0	9.0
	:	:	2	2	2	1	1

** 320/1; 320/39; 320/41; dll.

(Data dari tabel Langkah 5.)

kolom ranking: 1 = tertinggi ... 5 = teramat rendah

LANGKAH 8. Seleksi kegiatan pendahuluan:

Pilih suatu kegiatan yang mempunyai pendapatan tinggi yang memperhacikan kepada salah satu sumber yang paling menghambat (yang paling konstrain) atau yang sangat berpengaruh kepada salah satu sumber yang menjadi konstrain.

6. Uk jumlah yang paling besar dari kegiatan itu, yang memungkinkan, hitung pendapatannya dan kebutuhan sumber (sumber dayanya).

Kedang-kedang akan jelas bahwa dua atau lebih kegiatan sangat bagus dan cocok/sesuai. Jika demikian, gabungkan mereka (sumber daya-sumber daya tsb) didalam seleksi dan perhitungan-perhitungan pendahuluan.

:	:	:	Buruh			Dana		
			Tanen	Bulan 1	Bulan 2		Bulan 3	
Pen-	:	:	Ha	HOK	HOK	HOK	Rp1000	
Jumlah pada permulaan	:	:	0	0.9	75	75	75	120
Jagung hibrida:	:	:						
Penerimaan yang tinggi	:	:						
untuk luas tanan. Coba	:	:						
menjadi 0.63 Ha batasnya.	:	:	292.40	-0.63	-74.30	-25.15	-44.38	-109.43
Keseimbangan	:	:	292.40	0.12	0.20	49.34	10.12	10.52

LANGKAH 9. Substitusikan (gantikan) satu atau lebih dari kegiatan-kegiatan yang dapat membantu menggunakan sumber-sumber secara penuh dan mungkin dapat meningkatkan total penerimaan. C6.5 Ind

Lihat pertama kali pada kegiatan lain bahan yang memberikan penerimaan yang tinggi kepada sumber-sumber yang paling merupakan konstrain. Berberapa "trial and error" (coba-coba) mungkin akan diperlukan sebelum kita sampai kepada gabungan (kombinasi) kegiatan-kegiatan yang memberikan pendapatan yang paling tinggi.

	: Pen- : dapatan : Rp1000	: Tanah : Ha	Buruh Bulan 1 HOK	Buruh Bulan 2 HOK	Buruh Bulan 3 HOK	Dana Rp1000
Junlah pada permulaan	: 0	: 0.8	75	75	75	120
Jagung hibrida:	:	:	:	:	:	:
Penerimaan yang tinggi	:	:	:	:	:	:
untuk lluasan tanah. Coba:	:	:	:	:	:	:
menjadi 0,63 Ha batasnya:	: 292.40	: -0.63	-74.30	-25.16	-44.88	-105.48
Keseimbangan	: 292.40	: 0.12	0.20	49.84	30.12	10.52
Kurangi jagung hibrida	:	:	:	:	:	:
dengan 0,20 Ha	: -86.00	: 0.20	22.00	7.40	13.20	32.20
Keseimbangan	: 206.40	: 0.32	22.20	57.24	43.32	42.72
Tambah 0,32 Ha kacang hij:	: 120.00	: -0.32	-15.36	-10.88	-8.00	-15.04
Keseimbangan	: 326.40	: 0.00	6.84	46.36	35.32	27.68

Jadi kombinasi yang mungkin paling baik untuk kegiatan tanaman pangan untuk konstrain luas lahan yang 0,30 Ha itu adalah: 0,48 Ha untuk jagung hibrida dengan pendapatan Rp 206.400, dan 0,32 Ha untuk kacang hijau dengan pendapatan Rp 120.000.

Maka pendapatan dari 0,80 Ha dengan faktor pembatas (sumber-sumber yang konstrain) seperti diatas yaitu tanah 0,30 Ha, buruh pada Bulan 1: 75 HOK, pada Bulan 2: 75 HOK, pada Bulan 3: 75 HOK dan dana sipertani = Ro 120.000, adalah sebanyak Rp 326.400.

Dan masih ada tersisa (tidak habis digunakan) sumber-sumber pembatas (konstrain sumber-sumber) yaitu: 5,34 HOK pada Bulan 1; 46,36 HOK pada Bulan 2; 35,32 HOK pada Bulan 3; dan dana sebanyak, Ro 27,680.

(Sam Pakpanan (Binas/Usanetani) dan David Brown (SFCDP/USAID), Sep 1989.
Metode dari: FAO "Farm Management Research for Small Farmer Development", 1984.)

SENSITIVITY ANALYSIS
TO HELP POLICY DECISIONS

C7

Simulation analysis (budgeting, spread-sheets, and linear programming) can be used to estimate how farmers' earnings would be affected if certain changes in prices or policies were made. Here is an example:

For the farm situation used in the preceding section (C6), what would happen if the price of soybeans (kedele) were to increase? At what price would it become profitable to produce soybeans? With sensitivity analysis, you assume all other prices remain the same as before. Then you calculate how each of several price levels for soybeans would affect the farming system and income.

We used linear programming and a computer to determine the crop combination that would maximize net income at each soybean price level. The results of this sensitivity analysis were:

"Optimum" has. of:

<u>Assumed net soybean price</u>	<u>Hbd jaquq</u>	<u>Kc hijau</u>	<u>Kedele</u>
275	.59	.21	---
300	.59	.21	---
400	.53	.14	.13
500	.03	.30	.47
600	.03	.30	.47

(Please note that this is not a real example, so one should not draw policy conclusions from it.)

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FARM MANAGEMENT ANALYSIS
TO HELP FORMULATE PROGRAMS AND PROJECTS

C8

When designing programs and projects, there is need to see what would happen to typical farmers if they were to shift from their present food-crop systems to recommended systems and practices. There is need also to see what would happen if various constraints that impede these changes were removed -- e.g., lack of water, capital, or sources of good seed. The farm management methods that we have described -- budgeting, spread-sheets, and linear programming -- can help in such assessments.

The baseline studies, rapid rural appraisal, and other exercises related to program/project design should include farm management analysis of this kind. Merely surveying farmers, collecting descriptive facts, and tabulating averages for the areas as a whole will not do the job. (Are there really any "average" farmers in an area that has both sawa and dry land, large and small farms, part- and full-time farmers, etc.?) Case examples that represent the major variations in farmer-resource situations have to be identified. Then, likely program/project effects on these case situations have to be estimated. This requires input-output and price information from a number of sources besides the farmer survey itself.

On the next four pages is an outline showing the kinds of facts that are relevant. The outline shows also how these facts can be brought together, using partial-budgeting, to estimate the effects of changes in food-crop systems on typical a farmer's income. Note two features of this approach:

- 1) Emphasis is on the resources and constraints of the entire farm (and not just a single hectare on a single plot of land).
- 2) Emphasis is on incremental change. The budget includes only the variable costs and returns. There is no need to include fixed costs -- i.e., items not affected by the change.

David Brown AED/CTTA 6oct88

RAPID ANALYSIS OF
CHANGES IN FOOD-CROP SYSTEMS AND POLICY/PROGRAM IMPACTS
FOR A REPRESENTATIVE FARMER SITUATION
using a whole-farm, partial budgeting approach

Case farm no./name _____

Actual? ___ or Composite? ___ Location _____

Situation represented _____

Information sources

_____	_____
_____	_____
_____	_____

A. RELEVANT CHARACTERISTICS, ASSUMPTIONS, LIMITING FACTORS, ETC.

1. <u>Agronomic</u>	2. <u>Farm & family</u>
3. <u>Local setting & services</u>	4. <u>Markets, prices, etc.</u>

2

B. SEASONAL CALENDAR

Present system___ Possibility I___ II___ II___

	No.	M	A	M	J	J	A	S	O	N	D	J	F
Land use (by fields)													
Livestock													
Power (x=peak mos.)													
animal power													
tractor													
Labor (x=peak mos.)													
men													
women													
children													

- D. ADDITIONAL INFORMATION ABOUT THE FARM FAMILY
(if interviewing actual family)
- D1. What plans and aspirations for the future (is higher income the only concern? expect to stay in full-time farming?)
- D2. What led to recent changes made in the farming system and sources of income?
- D3. What memberships and sources of information related to farming?
- D4. To what extent does the farmer himself make decisions? (do landowners, moneylenders, etc. have much influence on cropping systems? do women in the family have important decision-making roles?)
- D5. How well is the farmer served by sources of credit, input suppliers, and marketing outlets?
- D6. What obstacles prevent this family from making recommended changes in food crop systems?
- D7. If recently made changes in food-crop systems, what led to these changes, and what were the most serious problems encountered?

David Brown dan Irma Hermin, SFCDP, 14oct88

ANALISIS CEPAT PADA
PERUBAHAN SISTIM TANAMAN PANGAN DAN
DAMPAK KEBIJAKSANAAN/PROGRAM UNTUK SUATU KEADAAN PETANI YANG
REPRESENTATIF DENGAN MENGGUNAKAN SELURUH LAHAN UNTUK PENDEKATAN
SEBAGIAN PERHITUNGAN BIAYA

Kasus petani no./nama _____

Sebenarnya? ___ atau Gabungan? ___ Lokasi _____

Gambaran situasi _____

Sumber informasi

_____	_____
_____	_____
_____	_____

A. SIFAT-SIFAT YANG SALING BERHUBUNGAN, DUGAAN, FAKTOR PEMBATAS, DLL.

1. <u>Aaronomis</u>	2. <u>Petani dan keluarganya</u>
3. <u>Penempatan & layanan setempat</u>	4. <u>Pasar, harga, dll.</u>

B. JADWAL BULANAN

Sistem saat ini___ Kemungkinan I___ II___ II ___

	No.	M	A	M	J	J	A	S	O	N	D	J	F
Penggunaan tanah/lahan													
Ternak													
Tenaga (x=bulan sibuk)													
tenaga ternak													
traktor													
Tenaga kerja (b/sibuk)													
Pria													
Perempuan													
Anak-anak													

One page for each change being evaluated

CB.3 Ind

C. BIAYA DAN KEUNTUNGAN NYATA DARI PERUBAHAN YANG SEBENARNYA ATAU DARI PERUBAHAN YANG DIUSULKAN

Perubahan dari _____
ke _____

C1. Perubahan dalam pembiayaan keluarga petani

Penambahan (+) atau Pengurangan (-) Biaya	Item	Jumlah	Harga	Jumlah Total	Saat bln
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Perubahan bersih dalam pengeluaran _____
Bulan yang terbanyak dalam penambahan pengeluaran _____

C2. Perubahan keuntungan langsung untuk keluarga petani

Penambahan (+) atau Penghematan (-) Keuntungan	Item	Jumlah Harga	Jumlah Total	Saat bulan
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

Perubahan bersih dalam pengeluaran _____
Bulan tertinggi dalam penambahan keuntungan _____

C3. Akibat lain dari perubahan-perubahan ini (Efeknya terhadap menu makanan keluarga, keamanan, pengawetan tanah, orang-orang yang berhubungan dengan keluarga petani, dll.).

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- D. INFORMASI TAMBAHAN MENGENAI KELUARGA PETANI
(jika mewawancara langsung pada keluarga tani)
- D1. Rencana dan cita-cita apa untuk masa mendatang (apakah hanya soal keuntungan yang tinggi? berharap untuk tetap jadi petani seutuhnya?)
- D2. Apakah arah pada pembuatan perubahan-perubahan sekarang ini dalam cara bertani dan sumber-sumber itu karena penghasilan?
- D3. Anggota-anggota dan sumber-sumber apa yang berhubungan dengan informasi pertanian?
- D4. Sejauh mana yang dilakukan petani itu dalam membuat keputusan? (apakah tuan tanah, tengkulak/ijon dll. mempunyai pengaruh yang kuat dalam sistim tanam? apakah istri/wanita dalam keluarga mempunyai kedudukan penting dalam membuat keputusan?)
- D5. Sebaik apa petani dilayani oleh sumber-sumber kredit, pasokan supplier, dan sumber-sumber pasaran?
- D6. Kesulitan/hambatan apa yang mencegah keluarga tani tersebut untuk menganjurkan perubahan dalam sistem tanaman pangan?
- D7. Bila saat ini ada perubahan-perubahan dalam sistim tanaman pangan, apa yang menyebabkan perubahan itu, dan masalah apa yang paling serius ditemui.

FARM MANAGEMENT ANALYSIS IN EXTENSION WORK
TO HELP FARM FAMILIES MAKE THEIR OWN DECISIONS

C9

In Indonesia and many other developing countries, farm management data are obtained from farmers for use by national agricultural officials. The farmers themselves and the local extension workers who collect the data receive little direct benefit. However, the same data and the same methods of analysis can be used by them to determine the kinds of crops and practices that will be most profitable in their own locations.

In the early stages of development, extension programs usually provide farmers with standard recommendations and all farmers in an area are encouraged to adopt the same practices. But as economies modernize, farmers tend to specialize and to have more business transactions. Also, their farming systems have to be adjusted each year to reflect changes in prices, available inputs, and technology. It becomes productive to teach farmers and their wives how to keep their own financial records and to do simple budgeting analyses. Some examples of extension programs that have emphasized farm management are:

- ** Teaching demonstration farmers how to keep records and do farm planning, and asking them to make this farm management information available to visitors.
- ** Group meetings in which farmers compare costs, returns, and efficiency factors as a basis for discussing how to improve their production and marketing systems. (See next page.)
- ** Farm-and-home-development programs in which extension agents teach low-income farm families how to monitor expenditures and to make better decisions related to their individual goals and financial situations.
- ** Establishing a network of farmer-cooperators, in which the farmers receive special farm management training in return for their making their records available for use by agricultural program officials. (This is more successful if farmers' names are not identified.)

AN EXTENSION INFORMATION SHEET

C9.1

DESIGNED TO HELP FARMERS EVALUATE THEIR ECONOMIC EFFICIENCY

PROJECTED CORN PRODUCTION COSTS IN 1990

	Typical	Your Estimate
1. ESTIMATED OPERATING COSTS/ACRE		
Seed (\$72/bag, 22,000 seeds/ac.)	\$ 19.80	\$ _____
Fertilizer: N - 130 lbs. @ 22¢	28.50	_____
P - 60 lbs. @ 23¢	13.80	_____
K - 80 lbs. @ 15¢	12.00	_____
Lime (annual cost)	4.00	_____
Crop chemicals	16.00	_____
Machinery fuel, oil, and repair	33.00	_____
Machinery hire and services	8.00	_____
Miscellaneous	11.00	_____
Other: <u> (crop insurance) </u>	8.00	_____
Operating interest (1/2 operating costs x .11)	8.50	_____
	\$162.60	\$ _____
2. ESTIMATED OWNERSHIP COSTS/ACRE		
Machinery depr. and interest	\$ 26.00	\$ _____
Real estate taxes, depreciation, and interest (or rent)	65.00	_____
	\$ 91.00	\$ _____
3. ESTIMATED LABOR COST/ACRE (4.8 hours x \$4.50)		
	\$ 21.50	\$ _____
4. ESTIMATED TOTAL COSTS/ACRE		
	\$275.10	\$ _____
5. ESTIMATED TOTAL COST/BU. (100 bu.)		
	\$ 2.75	\$ _____
6. ESTIMATED NET RETURN/ACRE OVER VARIABLE COSTS		
a. Avg. price/bu. expected \$ _____		
b. Avg. yield/acre expected _____ x avg. price/bu.		\$ _____
c. Estimated variable costs/acre (Item 1)		\$ _____
d. Net return over variable costs/acre (b minus c)		\$ _____

Source: Farm Management Newsletter, University of Missouri-U.S.
Department of Agriculture Cooperative Extension Service,
December 14, 1989.

ANALYZING WAYS TO HELP FARMERS
MAKE THESE CHANGES

PART D

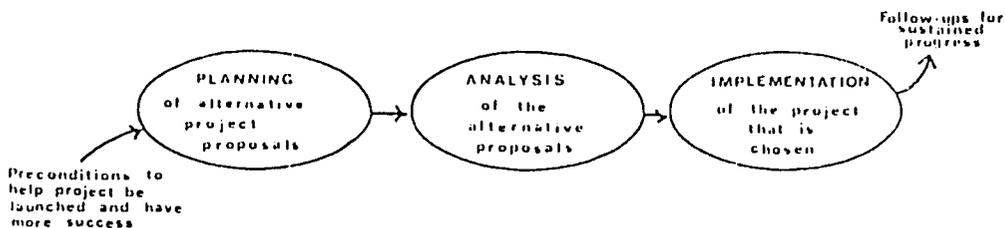
- D1. Food-crop programs and projects, and the importance of change-agents at province and local levels.
- D2. Steps for launching new food-crop development activities.
- D3. Identifying problems to receive special attention.
- D4. "Choice profiles" to provide overview of within-project decisions.
- D5. The challenge of making the most of limited change-agency resources.
- D6. Spread-Effects.
- D7. Assessing the advantages and disadvantages of alternative program possibilities.
- D8. Is there time and need to have a pilot project?
- D9. Balanced program management.
- D10. Important elements of cooperation.
- D11. Monitoring, feedback, and evaluation.
- D12. Project phase-out and follow-up.

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AND THE IMPORTANCE OF CHANGE-AGENTS AT PROVINCE AND LOCAL LEVELS

Programs, projects, and special campaigns are the "cutting edge" of food-crop development. They are the connecting links between 1) national policies, strategies, and targets and 2) actual responses of farmers and other target groups at the local level. If they are not designed and implemented effectively, much money and time will be wasted.

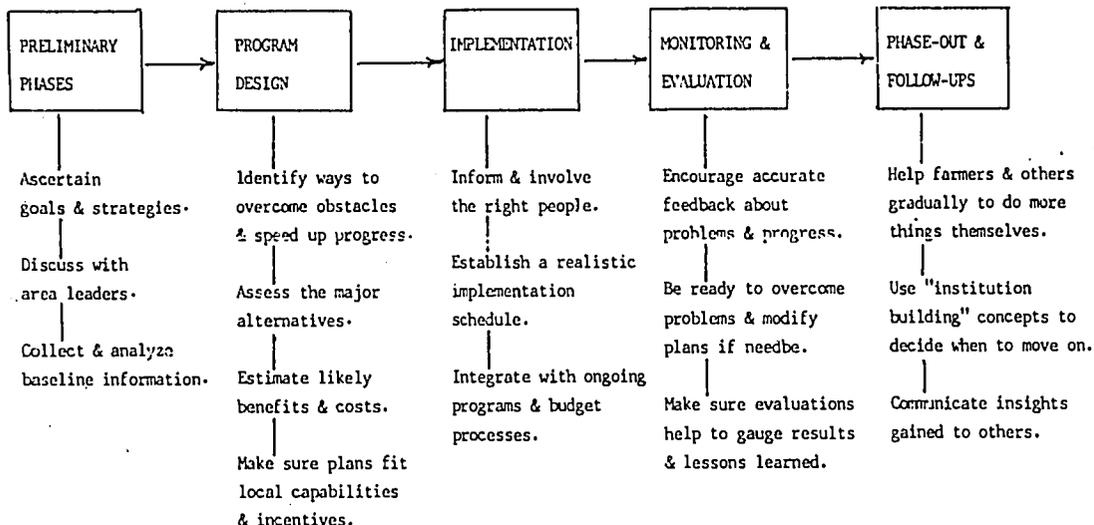
The success and cost-effectiveness of these programs and projects depends on the energies, knowledge, and creativity of "change-agents" at province and local levels -- extension workers, technical specialists, middle-level managers, and others. They need to have skills in analyzing local needs and potentials, in adapting plans to local conditions, and in mobilizing action. They need to be given a "task environment" by higher officials that provides the needed resources and encourages creative endeavour.



This section of the handbook calls attention to some important aspects of local program/project design and implementation. It does not include everything. It emphasizes some aspects that often cause disappointments in food-crop development. As we shall see, systematic planning and organization does not ensure success. The "human element" -- effective communication and understanding how to motivate people -- is all-important.

If you are helping to design and implement a new program or project from the very beginning, you will probably want to follow an orderly series of steps something like the following:

Steps for Planning and Implementing Palawija Programs in New Provinces

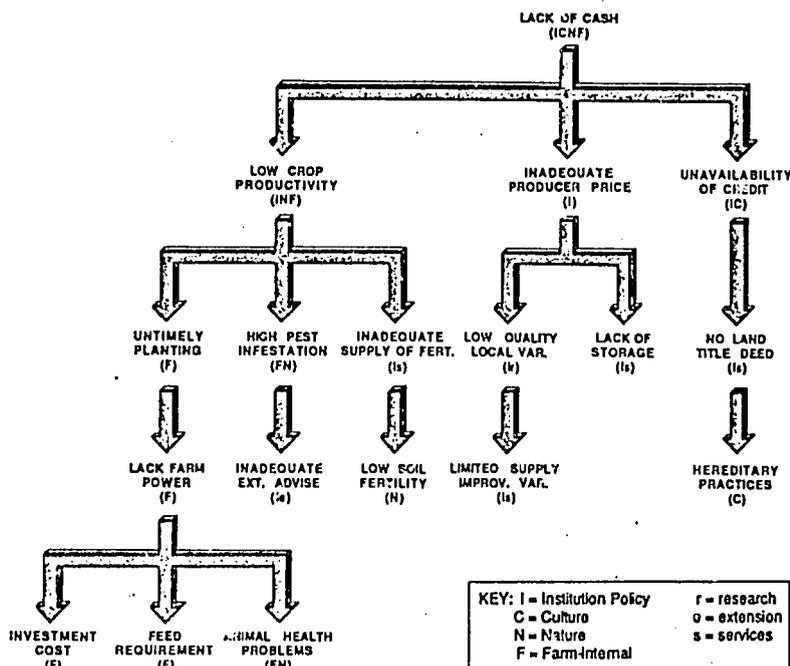


Questions for thought and discussion:

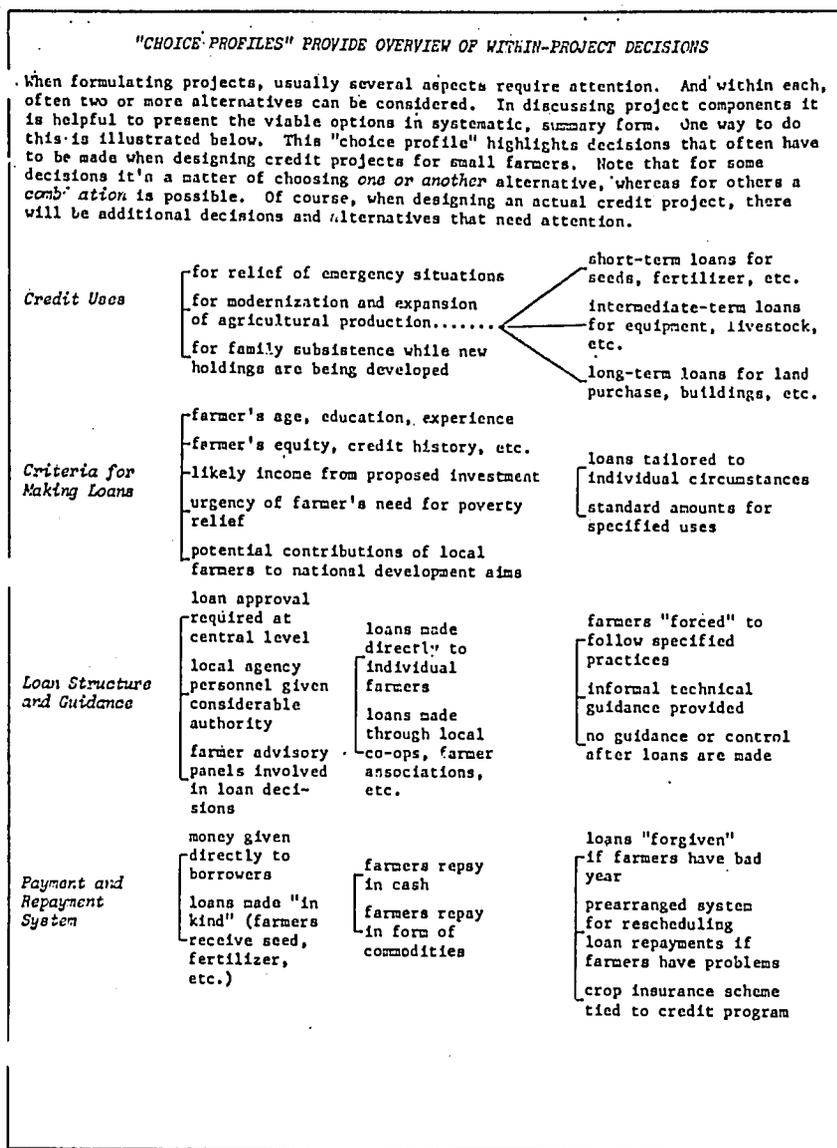
1. If you were making an outline like this, would you emphasize the same steps?
2. Which of these steps can the SFCOP-USAID group itself handle, and which have to be done with help from others?

However, you may "inherit" a program or project that has already been started. Maybe you have to "live with" a design that does not fit local conditions very well. Maybe you have to remedy some mistakes that were made during the early implementation stages. Maybe there is not enough time or money remaining to do everything that was intended, and you have to make some difficult changes. Maybe government or donor-agency officials have lost interest in the project, and you have to do what you can without much support at higher levels. So the mobilization process is not merely a matter of carrying out a series of steps "by the numbers".

A major purpose of baseline studies and rapid appraisal visits is help identify the factors that prevent farmers from adopting improved food-crop practices and systems. One way to summarize this information is to prepare a constraint tree like the following example from the FAO publication, "Farming Systems Development" (1989):



It is not necessarily best to try to overcome all the constraints. That might spread your efforts too thinly. Other agencies or projects may be better suited than yours for dealing with some of the constraints. Sometimes farmers can solve these problems through group action of their own. Sometimes action has to be taken at the national policy level. (In that case, you can have a valuable role of providing national officials with information about these needs.)

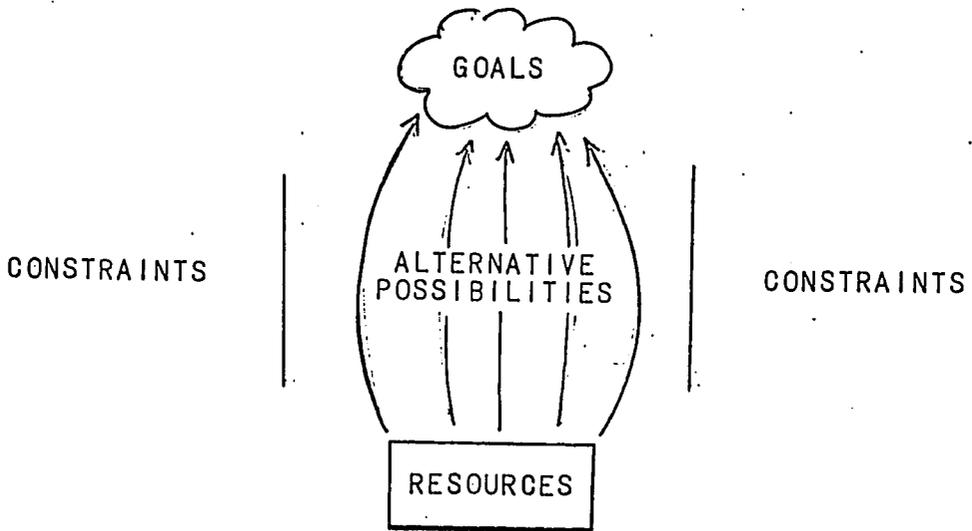


From David W. Brown and others, Planning Agricultural Projects for Successful Implementation, USDA/AID Training Manual, 1977.

THE CHALLENGE OF MAKING THE MOST
OF LIMITED CHANGE-AGENCY RESOURCES

D5.1

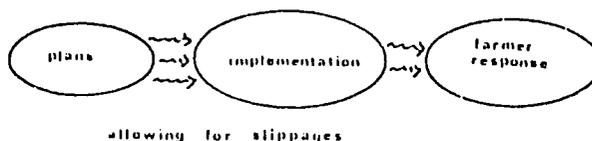
It will probably be true that your agency has very limited funds, staff, and facilities. Everything cannot be done at the same time in every place. Difficult choices have to be made about how best to use these resources. This is similar to farm management decision-making, except that the goals may be different (area-wide progress instead of individual farm profits).



Benefit-cost analysis (which is similar to budget analysis in farm management) can be used to help evaluate alternative ways to use scarce change-agency resources and to establish priorities.

BUT, one must be careful to ...

...take implementation slippages into account.

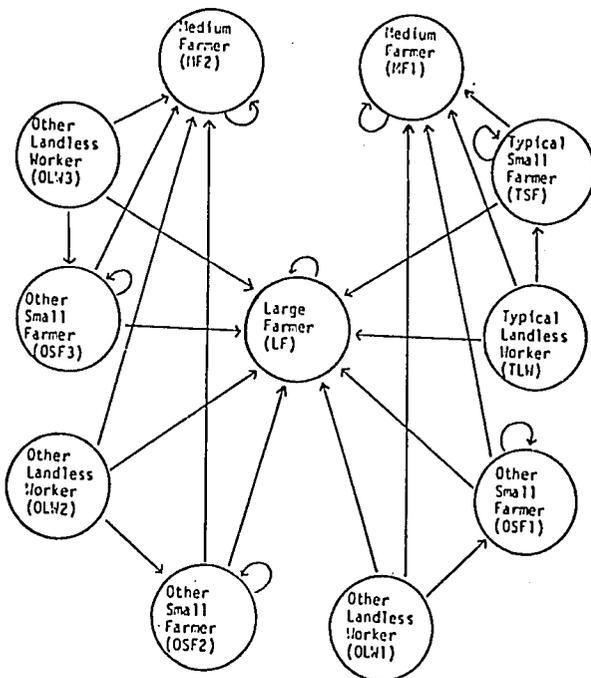


...and take indirect effects into account.

As shown by the diagram below, changes in farming practices by one farmer have indirect effects on employment of other farmers and landless workers:

The Scheme of Labor Interrelationships in Land Preparation for Non-Mechanical Technologies

→ : flow of hired labor
 C : flow of family labor



From Tuhpawana P. Sendjaja, Perspective Analysis of Small Community Capital Accumulation (PASCCA): A Model for Diagnosing Local Impacts of Agricultural Changes, with Applications to West Java Villages, Ph.D. Dissertation, University of Tennessee, June 1980, page 97.

When designing or evaluating food-crop programs, two kinds of effects have to be considered: 1) the percent gain in productivity or income of the typical farmer who adopts improved practices, and 2) the number of farmers who adopt new practices as a result of the program. Some programs benefit a few farmers greatly. Other programs have only small effects but reach a large number of farmers.

The example on the next four pages suggests a method for estimating and comparing spread-effects. It should be noted that the data are not real. The conclusions that are drawn will not necessarily apply to your situation.

**ESTIMATION OF SPREAD-EFFECTS
OF A PROVINCE CAMPAIGN TO IMPROVE SOYBEAN PRODUCTION PRACTICES**

D6.1 (1)

Assumed situation:

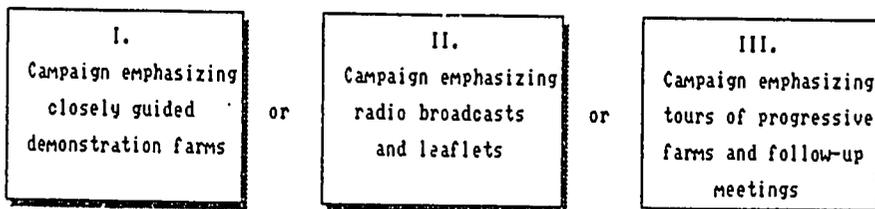
The Dinas Tanaman Pangan in a medium-size province wants to launch a campaign to increase soybean production and improve soybean practices in certain rainfed production zones.

Special funds are available to conduct the campaign for one year only.

The goals are to influence as many farmers as possible and to maximize gains in net income during the next three years.

Alternatives being considered:

Three alternative strategies are being considered:



Estimated effects of each alternative:

On the basis of previous experience and pilot projects in other places, Dinas Pertanian specialists predict that each alternative would have the following effects by the end of the three years if all available funds and staff were concentrated on this:

	<u>Alternative I</u>	<u>Alternative II</u>	<u>Alternative III</u>
Number of farmers with improved soybean practices at the end of the 3 years	990 farmers	2,430 farmers	760 farmers
Total gains in farmers' net incomes during the 3 years	Rp 327,000,000	Rp 440,100,000	Rp 140,000,000

For more details about how these effects were calculated, see the next three pages.

Conclusions:

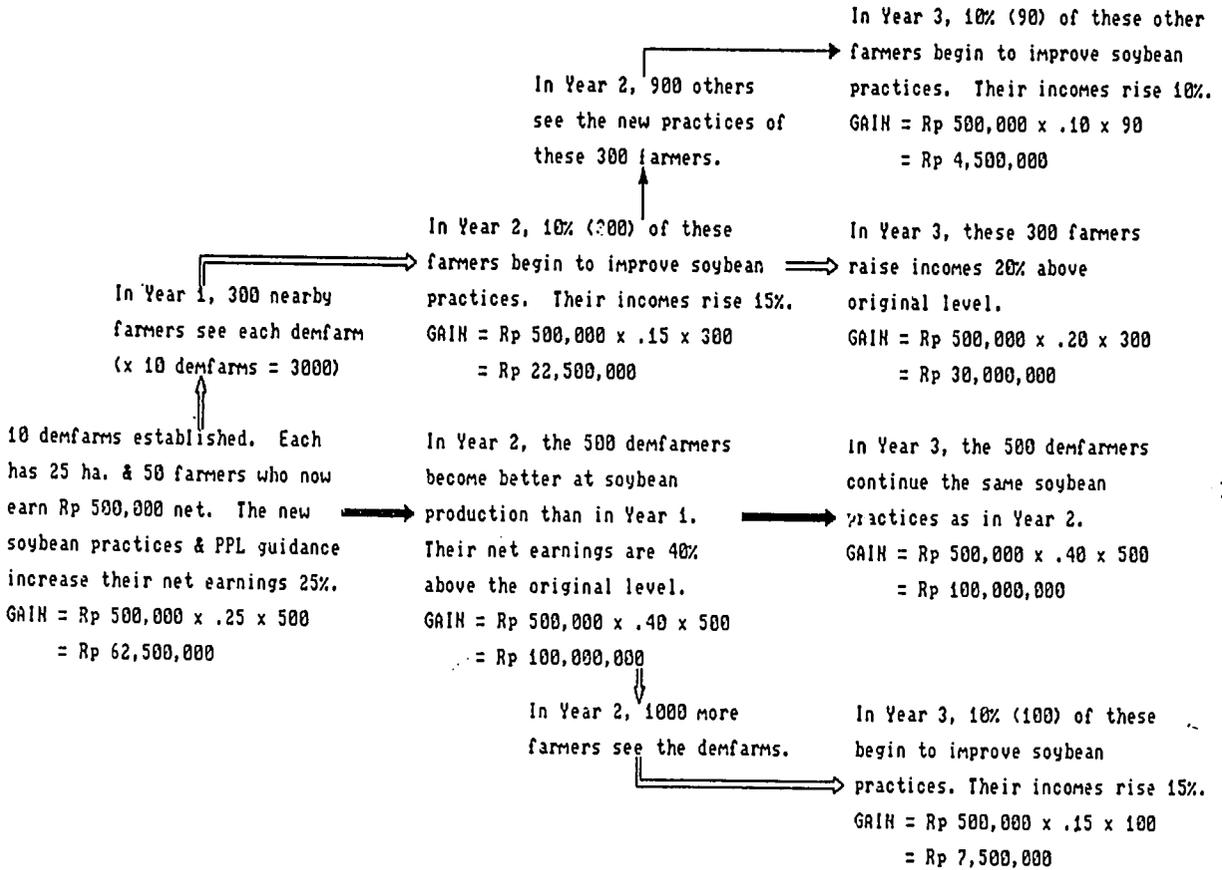
If these are the only criteria, it would appear to make sense to choose Alternative II.

However, it might be that Dinas Pertanian could consider some COMBINATION of these and/or other methods that would be even more effective.

Note that these estimates assume that the special campaign would be run for ONE YEAR only. The spread effects would be larger if the campaign were repeated or run in other places during all three years.

FLOWCHART II⁺
SPREAD-A

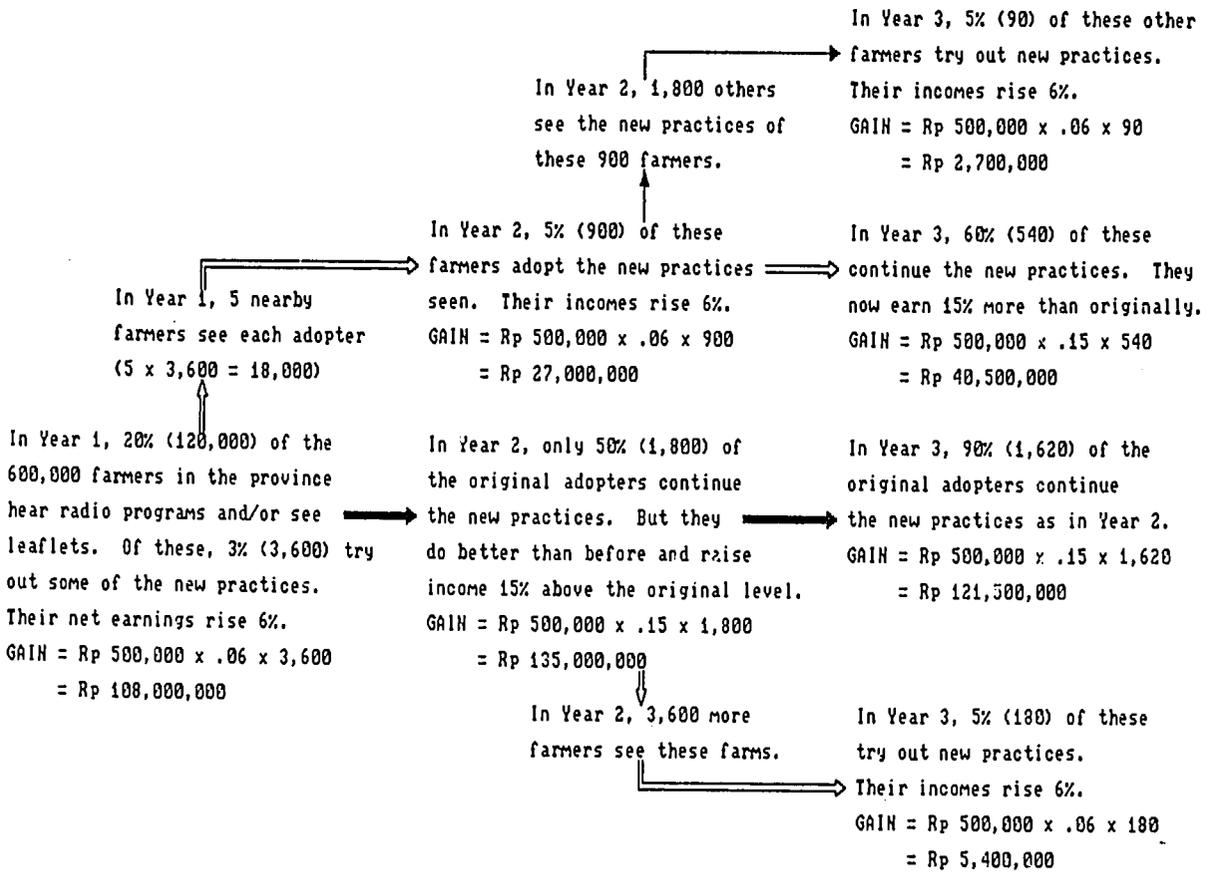
Alternative I: Campaign emphasizes closely guided demonstration farms



NUMBER OF FARMERS USING NEW PRACTICES AT THE END OF THE THREE YEARS 990 farmers

TOTAL GAIN IN NET INCOME DURING THE THREE-YEAR PERIOD Rp 327,000,000

Alternative II: Campaign emphasizes radio broadcasts and leaflets

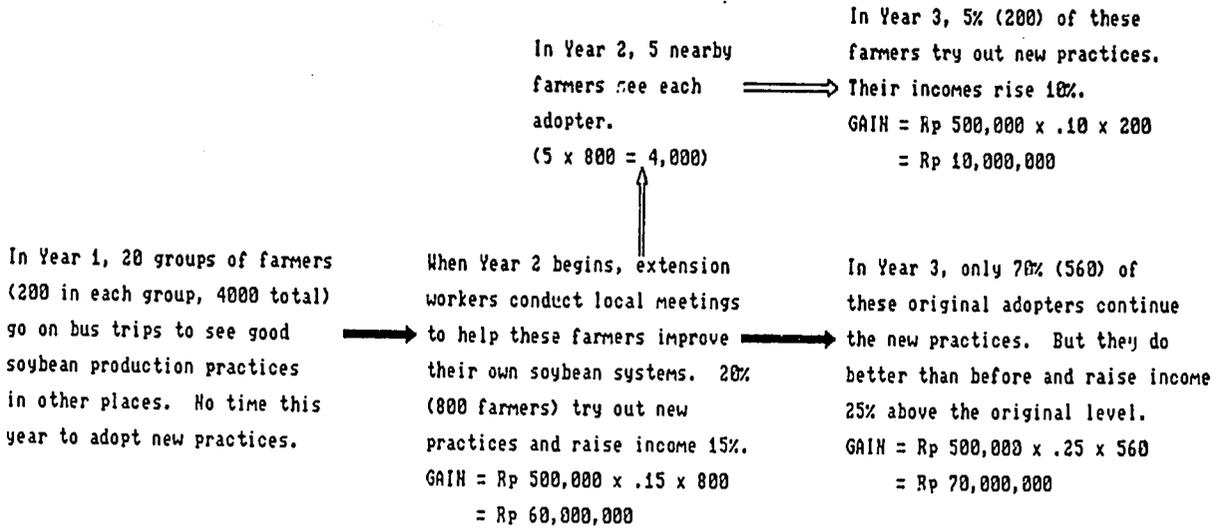


TOTAL NUMBER OF FARMERS USING NEW PRACTICES AT THE END OF THE THREE YEARS 2,430 farmers

TOTAL GAIN IN NET INCOME DURING THE THREE-YEAR PERIOD Rp 448,100,000

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Alternative III: Campaign emphasizes tours of progressive farms and follow-up meetings



NUMBER OF FARMERS USING NEW PRACTICES AT THE END OF THE THREE YEARS 760 farmers

TOTAL GAIN IN NET INCOME DURING THE THREE-YEAR PERIOD Rp 140,000,000

ASSESSING THE ADVANTAGES AND DISADVANTAGES
OF ALTERNATIVE PROGRAM POSSIBILITIES

D7

It is not always possible to compare programs in quantitative terms, using benefit-cost analysis or other means. But you can at least make a systematic list of their relative characteristics. Here is an example. It compares some alternative ways to disseminate information related to improved food-crop practices.

MEDIA CHARACTERISTICS IN THE JAVAN CONTEXT

	FEATURES OF MEDIA				TYPES OF MESSAGES		
	ease of dissemination	cost effectiveness	spread of impact	easily reviewed by user	can motivate	can instruct	can portray techniques
RADIO	H	H	H	N	H	H	N
CALENDAR/POSTER	M	H	M	H	L	M	L
FOTONOVEL	M	H	M	H	H	M	L
BOOKLET	M	M	M	H	L	M	M
VIDEOSCOPE	L	M	L	N	H	H	H
PARTICIPATORY VIDEO	M	H	L	H	H	H	H
SLIDE-TAPE	L	H	L	N	M	H	N
TELEVISION	H	L	H	N	H	H	H
DRAMATIC PERFORMANCE	L	L	L	N	H	L	L
MOVIE	L	L	M	N	H	H	H
DEMONSTRATION (PPL)	L	M	L	N	L	H	H

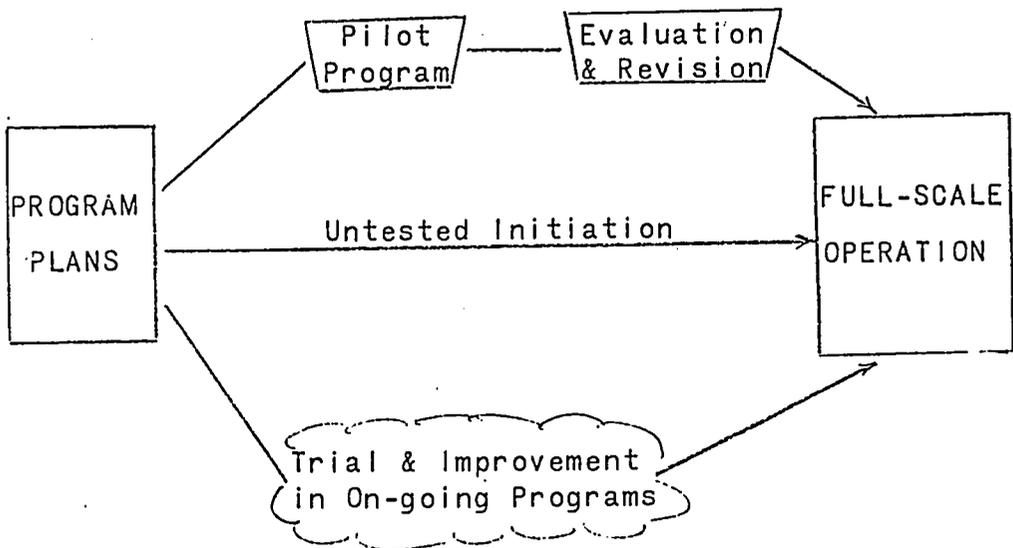
H = High
M = Moderate
L = Low
N = None

* While Participatory video (as described below) has a very low spread of impact in terms of numbers of persons reached by the message, it is recommended below to fill what is regarded as the single most pressing communications gap which exists in Indonesia--the need for policy-makers in the national capital to find out from farmers how they are affected by policies and other programmatic decisions.

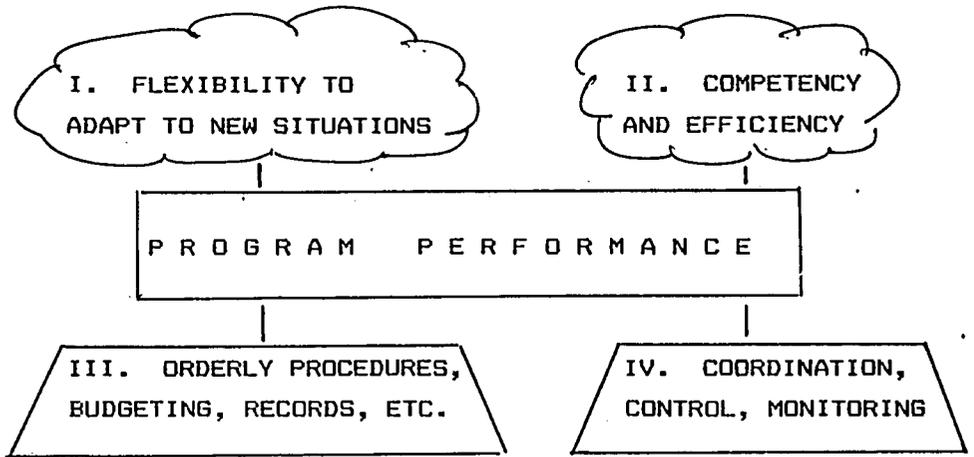
Source: Dr. James Mangan, SFCDP/USAID Communication Specialist, Malang, Indonesia, 1988.

Often a pilot or experimental project is undertaken on a limited scale before undertaking a major program. This can be useful, especially if you are trying out a new program method, or are working with a farming area for the first time, or it would be difficult to correct mistakes. But pilot projects require funds and they may delay the program itself. The gains of avoiding mistakes have to be weighed against the costs of delaying full-scale implementation.

One answer can be to use a learning-by-doing approach. The full-scale project is initiated, but there is flexibility to modify plans and to make improvements as experience is gained.



Program and project management can be conceived as consisting of four pivotal ingredients:



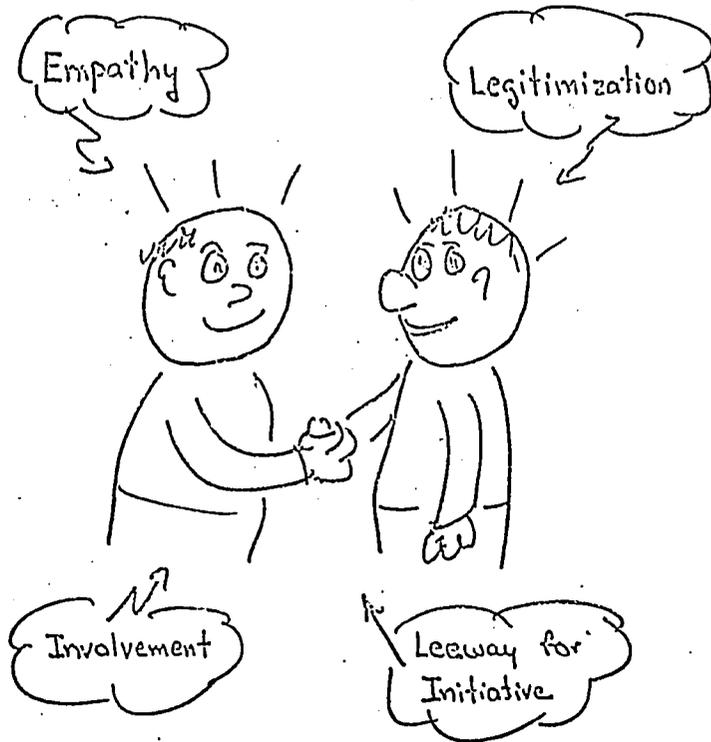
Components I and II are like balloons. They are what is needed to lift program performance to new heights. But if emphasized too much, a program will be set adrift without sense of direction or stability.

Components III and IV are like stabilizers. They insure orderliness, consistency, and accountability. But if emphasized too much, they will become bureaucratic weights that prevent programs from being innovative and productive.

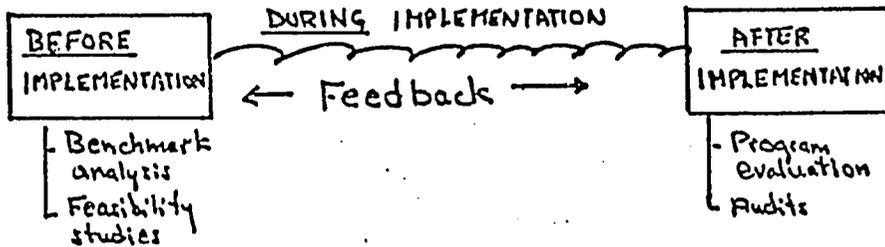
As agencies, programs, and staff become older, they tend to become more "bureaucratic". That is, they tend to emphasize III and IV. If a food-crop development project is to achieve new break-throughs, some way to prevent these tendencies from being overwhelming has to be found.

Adapted from writings by Professor Saul Katz, University of Pittsburgh.

In a modernizing economy like Indonesia's, a single government agency cannot do everything that is needed to accomplish food-crop development. There has to be communication and cooperation with other agencies ...with local groups ...with private businesses ...with other persons in your own agency. Even if your agency has the authority to compel people to do certain things, you will not get very far unless they genuinely wish to cooperate. It may help to provide monetary incentives. But even beyond that, four sociological ingredients can be especially important:

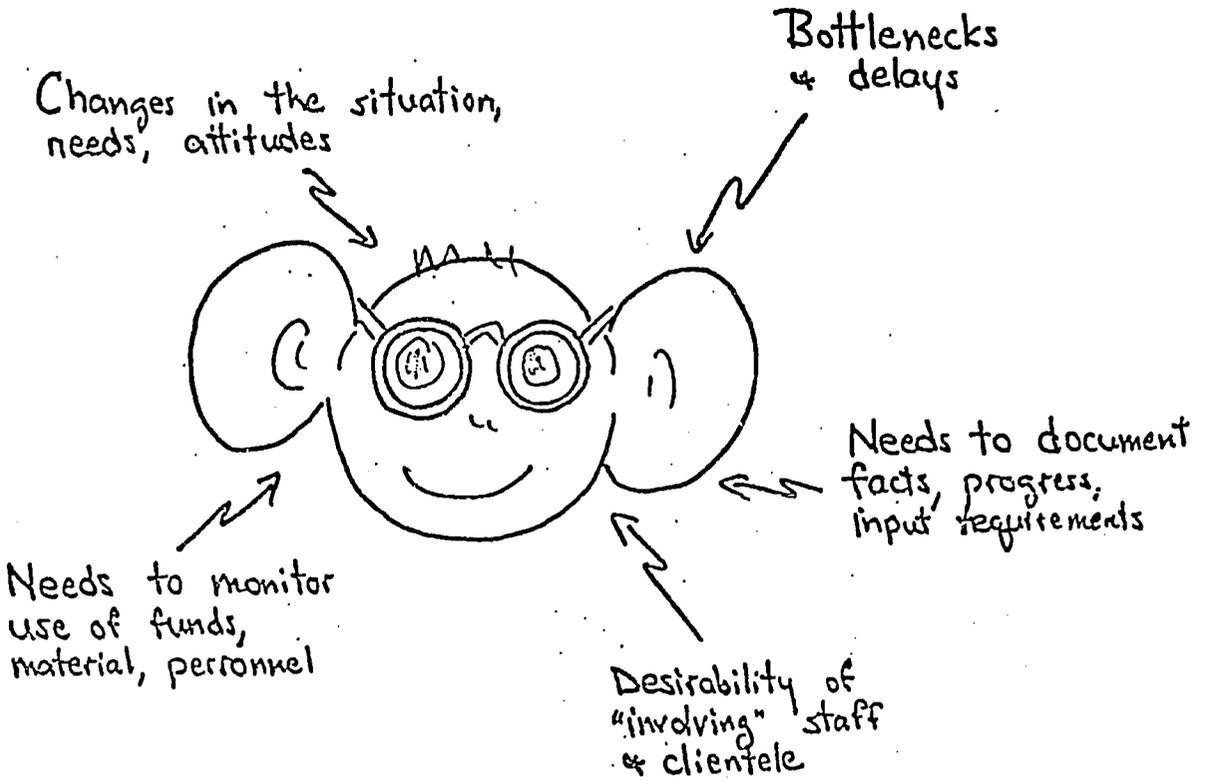


These days government and donor agencies place much emphasis on monitoring of projects while they are being implemented, and evaluating results at the end. Monitoring and evaluation are often carried out as a required routine, using standardized methods. Quantitative facts about tangible inputs and outputs are insisted upon. Many reports are written. Bureaucrats feel comforted to have such documentation in their files.

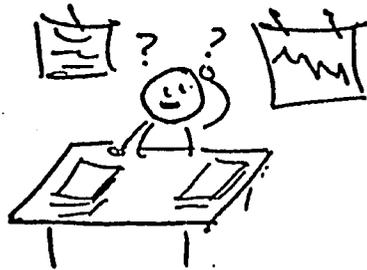


But is good use being made of this feedback? Is there readiness to improve project design and administrative procedures in light of the information received? Amid the emphasis on data, are important insights about the processes of food-crop development, the intangible aspects, and the long-term influences of the work being neglected?

Someday you may have the opportunity to make a plan for monitoring and evaluating a food-crop development project. On the next few pages are some aspects that may need special attention when preparing such a plan.



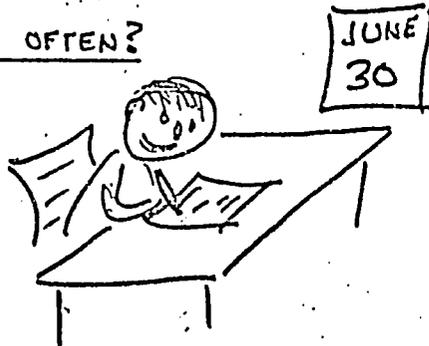
A. WHAT INFORMATION?



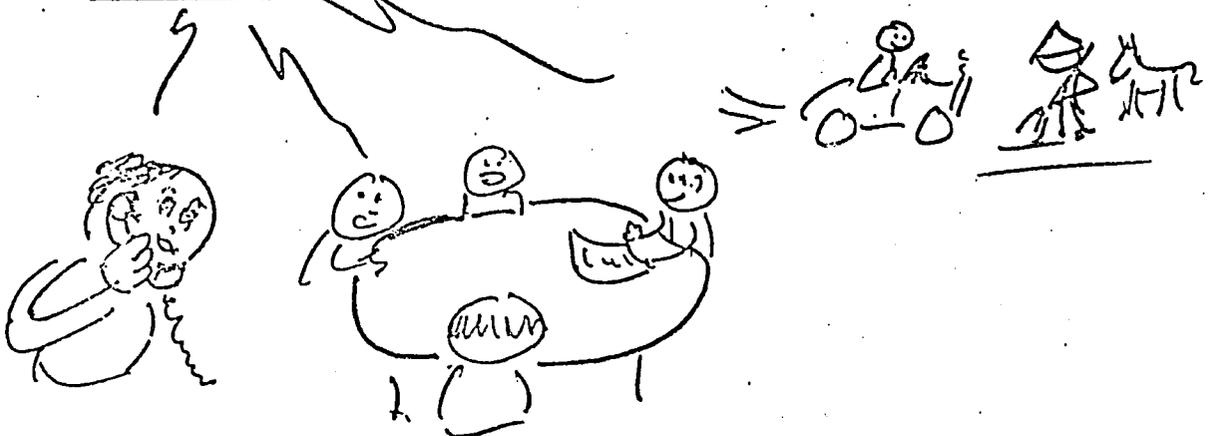
B. FROM WHOM? TO WHOM?



C. WHEN... AND HOW OFTEN?

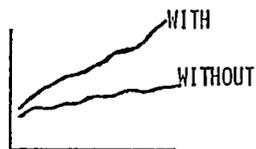


D. How?

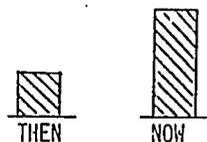


WITH--WITHOUT COMPARISONS

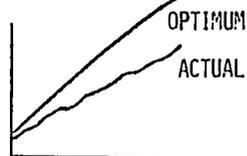
"CONTROL GROUPS"



BEFORE--AFTER COMPARISONS



ACTUAL--IDEAL COMPARISONS



SIMULATION

ESTIMATING WHAT DID, OR WHAT WOULD HAVE HAPPENED

CASE STUDIES

IN - DEPTH EXAMINATION OF SPECIFIC SITUATIONS

The end of a project may be just the beginning, so far as sustained efforts to improve food-crop systems are concerned. It is important to make a smooth transition. It is important also to ensure that the lessons learned, creativity, and spirit of energetic teamwork gained under the project are not lost.

