
Proceedings
of the
Second International Congress
of Somali Studies

University of Hamburg
August 1-6, 1983

edited by
Thomas Labahn

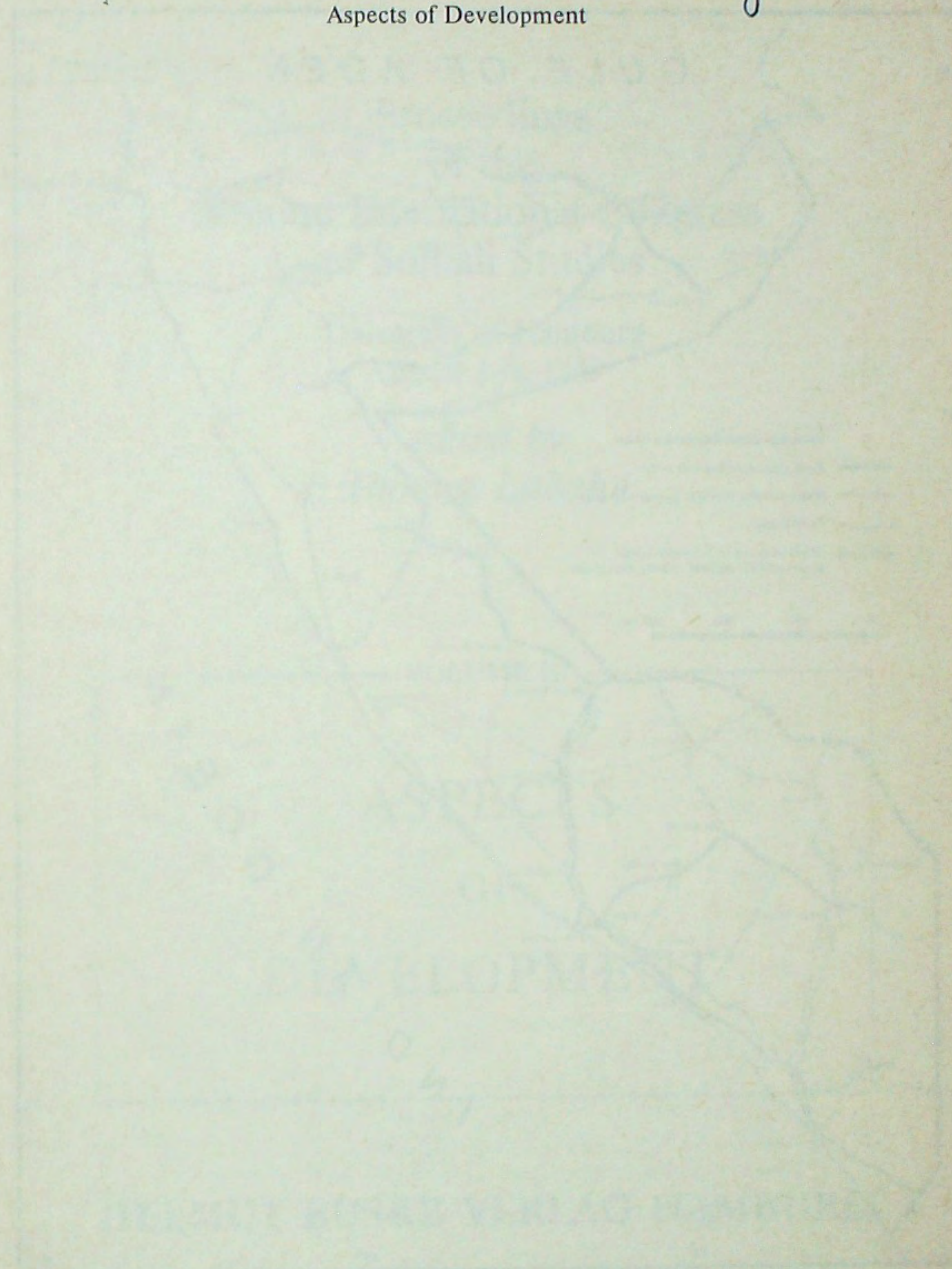
— VOLUME III —

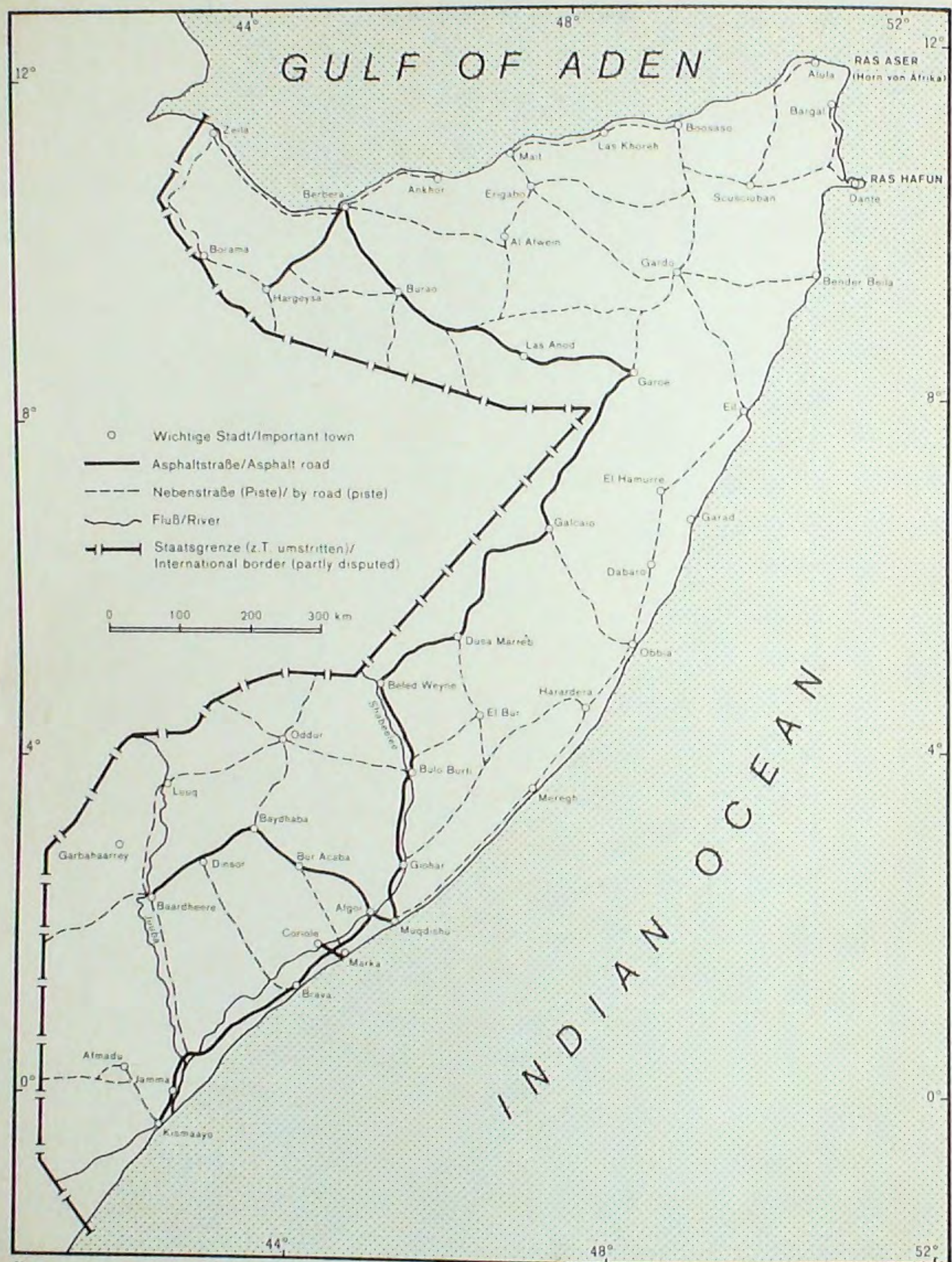
ASPECTS
OF
DEVELOPMENT

HELMUT BUSKE VERLAG HAMBURG

Annette Pughell

Aspects of Development





Übersichtskarte Somalia

Entwurf/Source: J. JANZEN

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VOLUME III

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Proceedings of the Second International Congress
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4 Volumes, cpl. ISBN 3-87118-695-3

Vol. I Linguistics and Literature ISBN 3-87118-691-0

Vol. II Archaeology and History ISBN 3-87118-692-9

Vol. III Aspects of Development ISBN 3-87118-693-7

Vol. IV Studies in Humanities and Natural Sciences ISBN 3-87118-694-5

CIP-Kurztitelaufnahme der Deutschen Bibliothek

International Congress of Somali Studies (02, 1983, Hamburg):

Proceedings of the Second International Congress of Somali
Studies / Univ. of Hamburg, August 1-6, 1983. Ed. by
Thomas Labahn. - Hamburg: Buske
ISBN 3-87118-695-3

NE: Labahn, Thomas [Hrsg.]; Universität (Hamburg)

Vol. 3. Aspects of development. - 1984.
ISBN 3-87118-693-7

ISBN 3-87118-695-3 (Set)
ISBN 3-87118-693-7 (Vol. III)

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Gesamtherstellung: J.J. Augustin, Glückstadt

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Editor's Preface

Three years after the first congress in Mogadishu, the Second International Congress of Somali Studies was held in August 1983 at the University of Hamburg. It attracted more than one hundred scholars from all over the world who are interested in Somalia and the Horn of Africa. Once again we could prove that Somalia had gained additional importance and interest. Many papers represented innovations in the field of Somali studies. As for the diversity of the topics presented, it clearly indicates the progress which has been achieved between the two congresses.

Scholars and researchers came from Italy, Somalia, the United States, Great Britain, Sweden, France and Germany. Out of the 89 papers which were presented in Hamburg 80 are included in the four volumes of the Proceedings. The contributors have been allowed sufficient time to incorporate results of the discussions held at the congress into the final version of their papers.

A wide variety of topics was discussed in Hamburg. This broad range placed considerable demands on the participants. But fortunately, one could see the geographer in the meetings of the medical group, the linguist when problems of development were discussed. So the attempt to bridge the gaps from one discipline to the other proved successful. And it is to be hoped that multidisciplinary efforts will be transferred into the practical daily work.

Whereas it has been already difficult to put the programme of the congress together in a meaningful manner, it has been not less complicated to compile the four volumes of the Proceedings. The result necessarily represents merely a compromise. It is a sum of individual efforts, incorporating faults as well as splendid achievements. These Proceedings

are a mirror which reflects the state of our science. As the editor I understood my job more as a documentarist - only taking care of the correct appearance of the articles. I carefully avoided taking any influence on the papers' content. Unfortunately, not every single paper has achieved "professional standard". Especially the lack of empirical work has to be mentioned. Sometimes even a deficit in theory is apparent. The results are rather frequently normative assertions which usually cannot contribute any positive steps in respect to the development process and the satisfaction of human needs.

Since we regard them mostly as documents our main concern was to publish the Proceedings as quickly as possible. This was necessary because some papers might lose their importance pretty soon. This will happen especially to those articles which outline the beginning or continuation of larger and more substantial work. In other parts the presented articles mark the conclusion of extensive research.

Somali studies have broadened enormously and include among other disciplines: social anthropology, sociology, political science, public health, economics, linguistics, ecology, history, geography, medicine, geology and archaeology. All these disciplines are represented within the four volumes. Sometimes it was difficult to place a certain article into a certain chapter or volume. And probably some authors might not be pleased to find their article incorporated where it appears.

Volume I contains linguistics and literature. In volume II all those articles are incorporated which deal with the history or some aspects of history of Somalia and neighbouring territories. Volume III is named 'Aspects of development'. All the articles concentrate especially on the development of Somalia which still is regarded as one of the

poorest countries of the world. There is a well deserved special emphasis on the agricultural sector. It is of paramount importance for this development process. - Finally, one can find articles on social anthropology, refugees, traditional and modern medicine, education and science and geology in volume IV.

Instead of describing each article in detail I would like to discuss another topic. It is worthwhile to consider the relationship between science and those institutions which have to initiate the development process. A close linkage between these two sectors would be advantageous for a country like Somalia which has an overwhelming lack of basic data. Unfortunately, the intention of the organizers to make the congress a forum for the exchange of knowledge and experience failed to some degree. Governmental and private agencies, and international organizations did not participate at the congress (with a few exceptions). This is a pity as once again the chance of communication is lost. True, it is sometimes difficult for both, the scholar and the administrator, to cooperate. Administration usually expects clear, praxis-oriented statements. Quite often those cannot be given by science. On the other hand the scholar expects clear, methodological questionings; but this implies already a precise knowledge and understanding of the problem within administration. Anyway, it will be necessary that the communication will be improved as only a strengthened cooperative research and implementation between researchers and operating institutions can guarantee that any issue will be analyzed in its specific terms and so to become relevant to the nation's current needs. One final point, Galtung used the term of 'scientific colonialism' to describe the process which transfers the main body of the acquisition of knowledge about one country

outside its borders. Even though science and research in Somalia are still in a state of infancy we were glad to realize that the number of Somali colleagues is steadily increasing, diminishing the above mentioned danger of 'scientific colonialism'. It is to be hoped that this tendency will continue.

As the organizer of the congress I gratefully acknowledge the generous grant from the Deutsche Forschungsgemeinschaft which helped to ensure the success of the congress. Additionally, I'm indebted to the University of Hamburg, the Deutsche Kreis für Somali Studien and the Deutsch - Somalische Gesellschaft.

As for the publication of the Proceedings I have to thank the Cultural Department of the Foreign Ministry of the Federal Republic of Germany, the Somali Academy of Sciences and Arts and Dr. Nottmeyer. And I have to point out especially that without the assistance, support and patience of Andrea Hauenschild-Franck, Evelyn Stöckle, Stefan Helming and Anneliese Altvater I would not have succeeded to publish these Proceedings in less than one year after the congress.

Mogadishu / Hamburg, April 1984

Thomas Labahn

David D. Laitin

SOME TRENDS IN SOMALIA'S POLITICAL ECONOMY

Introduction

The Somali revolution in 1969 created a sense of dynamic progress within the country that lasted up until 1974. The aggregate data, however, painted a slightly different picture. There were indeed arenas of progress in education, literacy and sexual equality; but only limited gains (and some losses) in economic development.¹

After the debacle of the Ogaden war of 1977-1978, much of the early optimism of the revolution began to dissipate. The leadership was accused of tribalism, lack of commitment to socialism, and despotism. Those who support the regime can point only to its tenacity: the president is nearly half way through his second decade of absolute rule. Sober assessments of the regime's performance are rarely provided. Perhaps it is worthwhile to look again at some aggregate figures in Somalia's political economy in order to make a proper judgement of the regime's performance and to highlight some new trends.

Four trends are particularly worth pointing out and should be put into a political context.

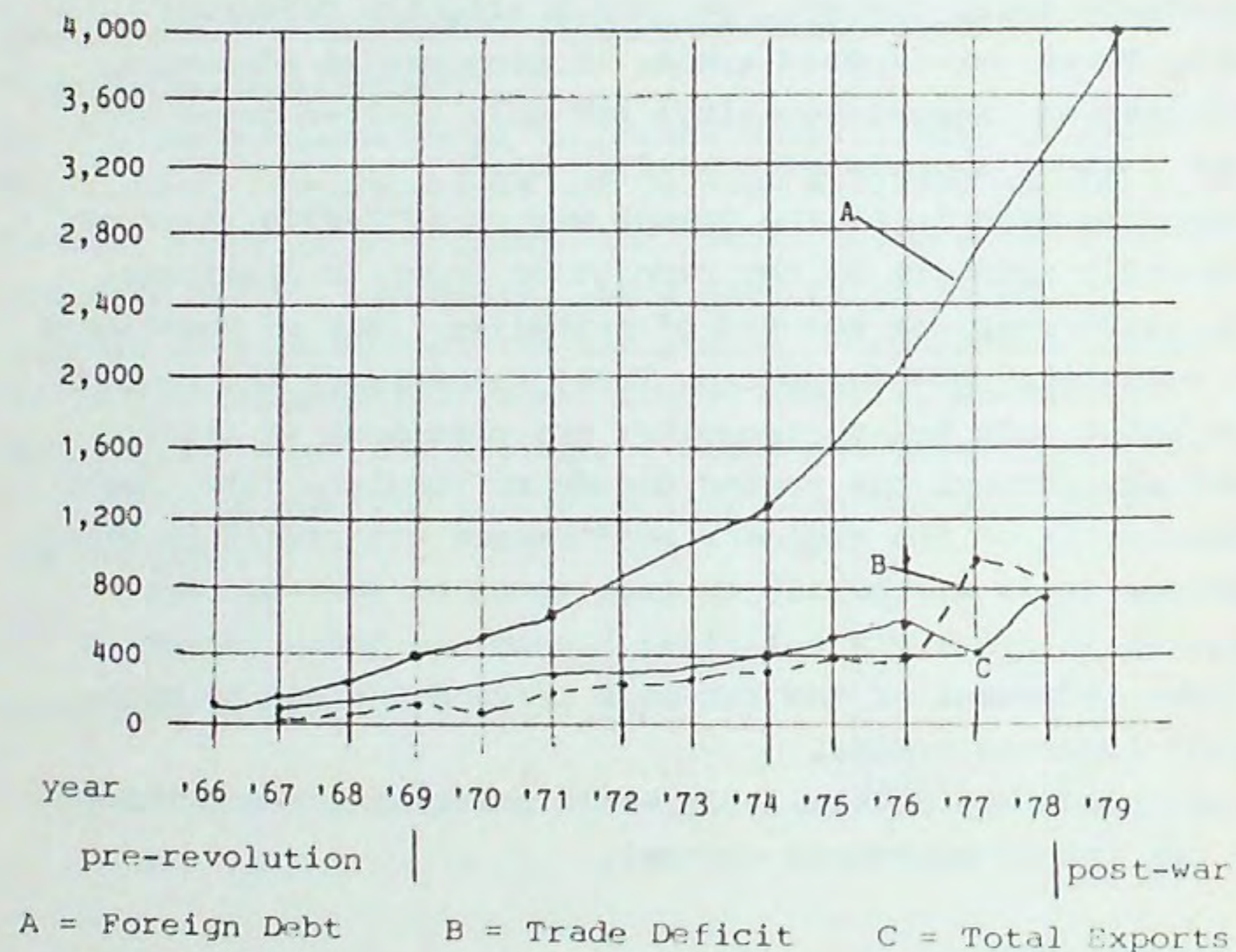
Exponentially increasing Foreign Debt

Somalia's foreign debt, like many other oil importing countries, has gone out of hand. Up until 1971, foreign debt increased at a rate commensurate with increased earnings from exports. But then it took off. By 1979, Somalia owed over 4000 million shillings. This would constitute the earnings on the total export of bananas (based on 1978 ex-

ports) for 75 years. About one third of this debt is owed to each of centrally planned economies, OECD countries, and OPEC countries. Table I graphically demonstrates the rise in Somalia's level of foreign debt.

Table I. Somalia: External Debt

Million Somali Shillings



sources: see Commission for Africa: Summaries of Economic Data, Somalia (January 1975)
OECD: Development Co-Operation Review (1976)
OECD: External Debt of Developing Countries (Paris 1981)

To be sure, many of those loans, especially to the Soviet Union, can be written off at this time (unless Somalia chooses to realign with the East). Furthermore, loans from the West are on the softest of terms, and few OECD countries really expect repayment. Most important, Somalia has not be saddled, as have other oil importing countries, with a growing petroleum bill. Over the past year, Somalia has received free refined petroleum from Saudi Arabia. With these facts in mind, we see Somalia having a debt burden of interest payments of about 6% of export earnings, which is not particularly bad under present conditions. Only the OPEC aid demands strict accountability and prompt repayments. But if Somalia hasn't yet had to pay a heavy economic price for its rapidly escalating debt figures, it will indeed be forced to pay a high political price. If it ever attempts to exercise the political option of opening up new negotiations with the Soviet Union, Somali officials will be forced to face again their debt ledger to the centrally planned economies. At present, Somali leaders have very little latitude for economic management without first consulting the International Monetary Fund and the World Bank. No government in Somalia, so long as it wishes to have open lines of credit in the world economy, can possibly regain the freedom of action available to the new revolutionary government in 1969. Just as Busia was shackled by the economic errors of Nkrumah in Ghana, so will any further government of Somalia be compelled to answer for the debts incurred by the present regime. Any leader who comes to power in Somalia will be watched carefully by Somalia's creditors, and this fact will constrain Somalia's freedom for at least a generation.

Regression in Somalia's Role in the World Economy

Somalia joined the modern world economy in the late 19th century when Somali nomads began to supply live animals for regular sale to the British colony in Aden. This is not to suggest that Somalis were not for a long time involved intimately with long distance trade; it is just to point out that the trade relationship with Aden constituted a modern trade network involving middlemen and timetables.

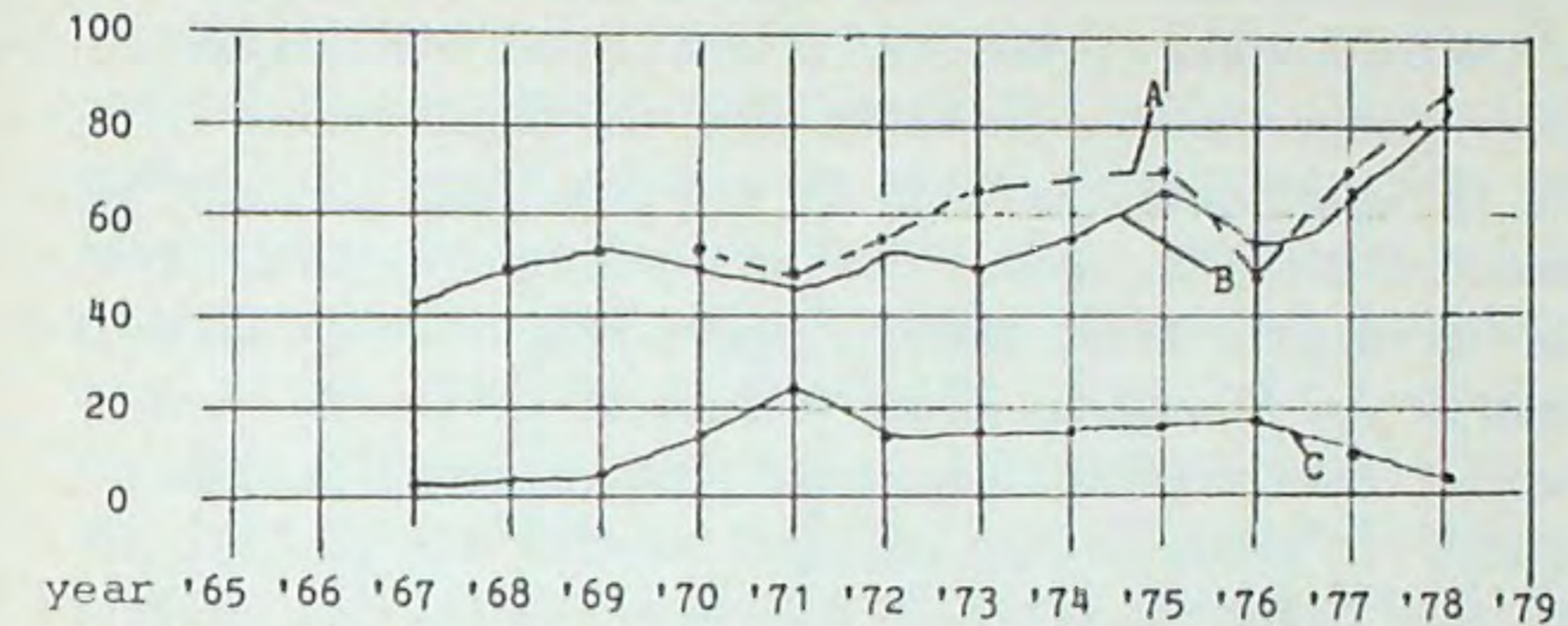
Mussolini was not satisfied with the idea that Somalia would play such a lowly role in the world division of labour. He envisioned La Grande Somalia, in which plantation agriculture would enrich the Horn (and the Italian plantation owners as well). Subsequent Somali nationalists had visions not unlike Mussolini's, and they hoped to develop the Somali economy so that it could provide food and manufactures for its population, and a wider array of exports to generate hard currency.

In the early years after the revolution of 1969, there was some indication of diversification. But recent trends suggest that Somalia's economy is regressing back to the role it played in the 19th century world economy. In the late 1960s, the export of live animals constituted less than 50% of Somalia's total export earnings; by 1978, those exports were nearly 90% of export earnings.

On the other side of the coin is the story of manufacturing. While only a negligible part of Somalia's exports in the 1960s, the revolutionary government sought improvement here as a key part of the socialist strategy. By the mid-1970s, manufactures hovered around 20% of total exports. But since the Ogaden war, things indeed have fallen apart. By 1978, the figure approached nil. The comparison between exports in live animals and manufactures appears graphically on table 2.

Table 2. Movement toward Monoculture (Supplier of Live Animals to Arabia)

As a percentage of total exports



A = Exports of live animals B = Exports to Saudi Arabia
C = Exports in manufacturing

sources: UN Yearbook of International Trade Statistics

The same story is repeated when the data on the production (rather than export) of manufactures are examined. In 1970, 30.60 thousand tons of sugar were produced; in 1979, the figure was down to 21.12. In 1975, Somalia produced 14.43 mill. tins of canned meat and 2.22 thousand tons of canned fish. In 1979, only 1.50 million tins of canned meat was produced and a negligible amount of canned fish. insufficient for the Central Bank of Somalia to record. In textiles there was some improvement, but in milk, pasta, packaging materials, cigarettes and matches, the trend has been downward since the mid-1970s.²

Somalia's regression in its position in the world division of labor has considerable consequences for political relations. Most important is that Somalia is increasingly tied to the economy of the Arab world. Table 3 shows that Somalia's economic and cultural connection with the Arab world

is at least as strong as its connection with the dominant industrial states in the world economy. In overseas development assistance, bilateral aid from OPEC states has clearly outpaced the funds from the advanced industrial states that form the Organization of Economic Cooperation and Development (OECD). By 1979, OPEC development aid to Somalia is about twice as high as aid from OECD states. As was shown on table I, nearly 90% of Somalia's exports went to Saudi Arabia in 1978. Table 3 shows that even if exports and imports are combined, trade with Arab states is more substantial than with OECD states. (This figure would be even higher if Saudi Arabia charged Somalia for petroleum. For the past year, Somalia has been getting its oil gratis). Perhaps more important, the percentage of Somali university students abroad who are studying in OECD states has declined considerably since the early 1970s. In fact, the number of Somali university students in Arab states has more than quadrupled since 1973, nearly catching up to those enrolled in OECD states.

Table 3. Somalia: Ties with OECD and Arab League compared

A. Foreign Aid (million S ODA)	<u>1973</u>	<u>1976</u>	<u>1979</u>
OECD - DAC (bilateral)	19.32	20.07	49.8
OPEC (bilateral)	--	33.40	94.8
B. Imports plus Exports	<u>1974</u>	<u>1976</u>	<u>1978</u>
OECD	77.6	93.0	163.3
Arab League	91.6	120.2	173.2
C. Somali Students at Universities	<u>1973</u>	<u>1976</u>	<u>1979</u>
OECD	424	362	548
Arab League	90	157	380

sources: OECD Development Co-Operation Review (various years)
UN Yearbook of International Trade Statistics
UNESCO Statistical Yearbook (various years)

These data suggest that Somalia's fate is becoming ever more closely intertwined with the fate of the Arab world. Other examples abound that would support the same conclusion. Some 220,000 Somali migrants work in the Arab peninsula. Their remittances home and their clever use of the franco valuta trading device have become essential for an increasing number of Somalis to procure basic necessities. The Arab states have demanded a price for this. They have put pressure on Somalia's Ministry of Education to upgrade Arabic education in the schools. In Mogadishu today, there is more reading material in the Arabic language available for purchase than there is in Italian or in the official language of the state, Somali. (There is still a considerable market in English paperbacks, and these books are more prevalent than popular Arabic books).³

Somalia joined the Arab League in 1974 in large part for instrumental reasons. Somali leaders recognized that the explosion of oil prices would mean hefty pay-offs for those who called themselves Arabs. Few Somalis took seriously the idea that they were Arabs. But in the future, with more Somalis receiving higher education in Arab states, more Somalis engaging in trade with Arab middlemen, more Somalis working for aid projects funded by OPEC, and more Somalis spending their working lives in Arab states, Somalia will identify itself more as an Arab state.

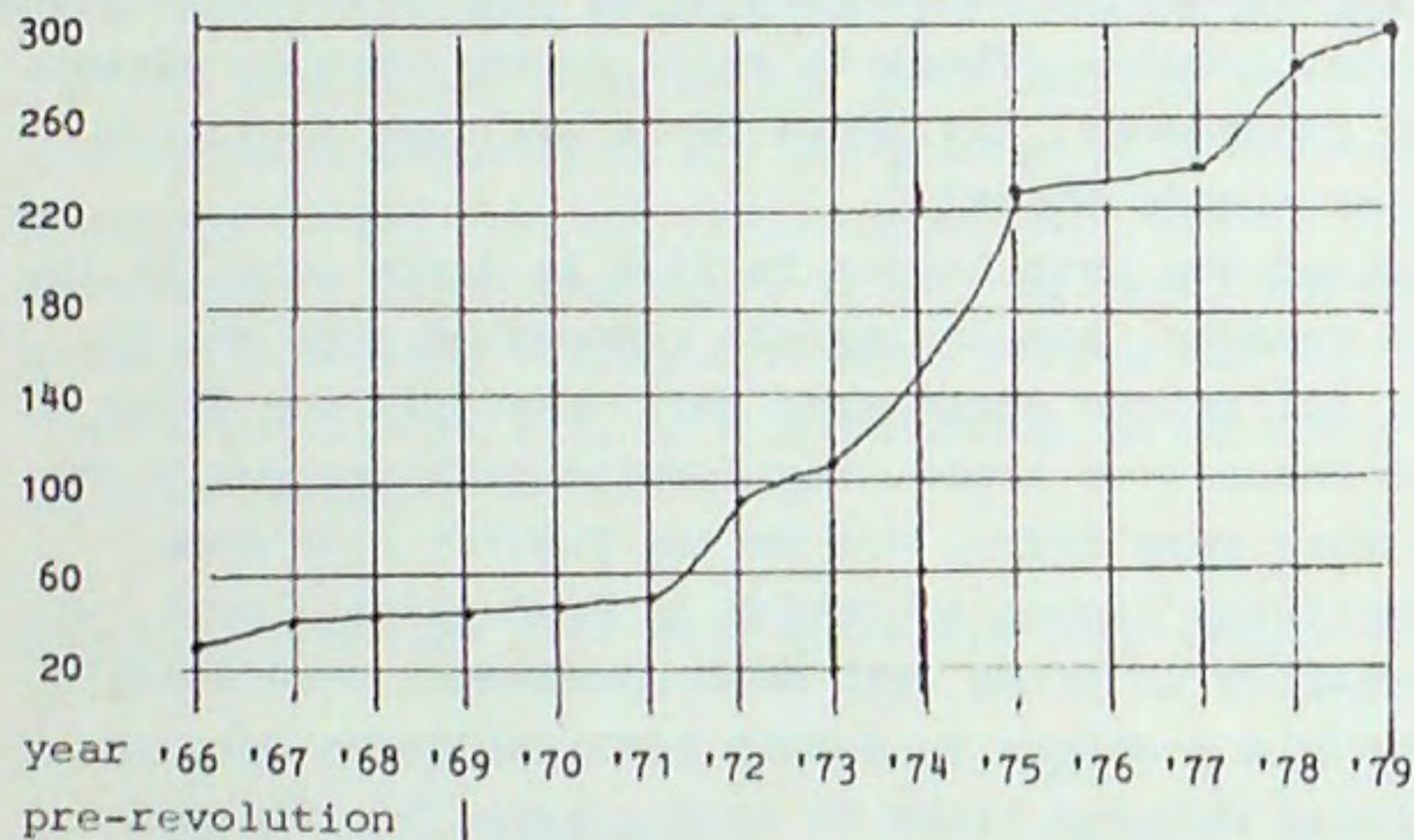
Progress Continues on Social Programs

The two arenas of clearest progress after the revolution concerned education and female equality. Data suggest that these arenas continue to demonstrate progress. Tables 4 and 5 illustrate that school enrollment continues to progress, even amid the terrors of the Ogaden war. While only 20 to 30 thousand students per year were enrolled in primary, intermediate and secondary schools during the civilian years,

those numbers shot up to over 100,000 in 1973. By 1979, the figure approaches 300,000. Less than 10% of the available population (aged 6-9) were in primary school in the late civilian years; now, over 40% are enrolled. The regime continues to be committed to the widespread availability of primary education, and its successes are remarkable.

Table 4. Social Progress - Some Trends (A)

School enrollment
(thousands of students in primary through secondary)



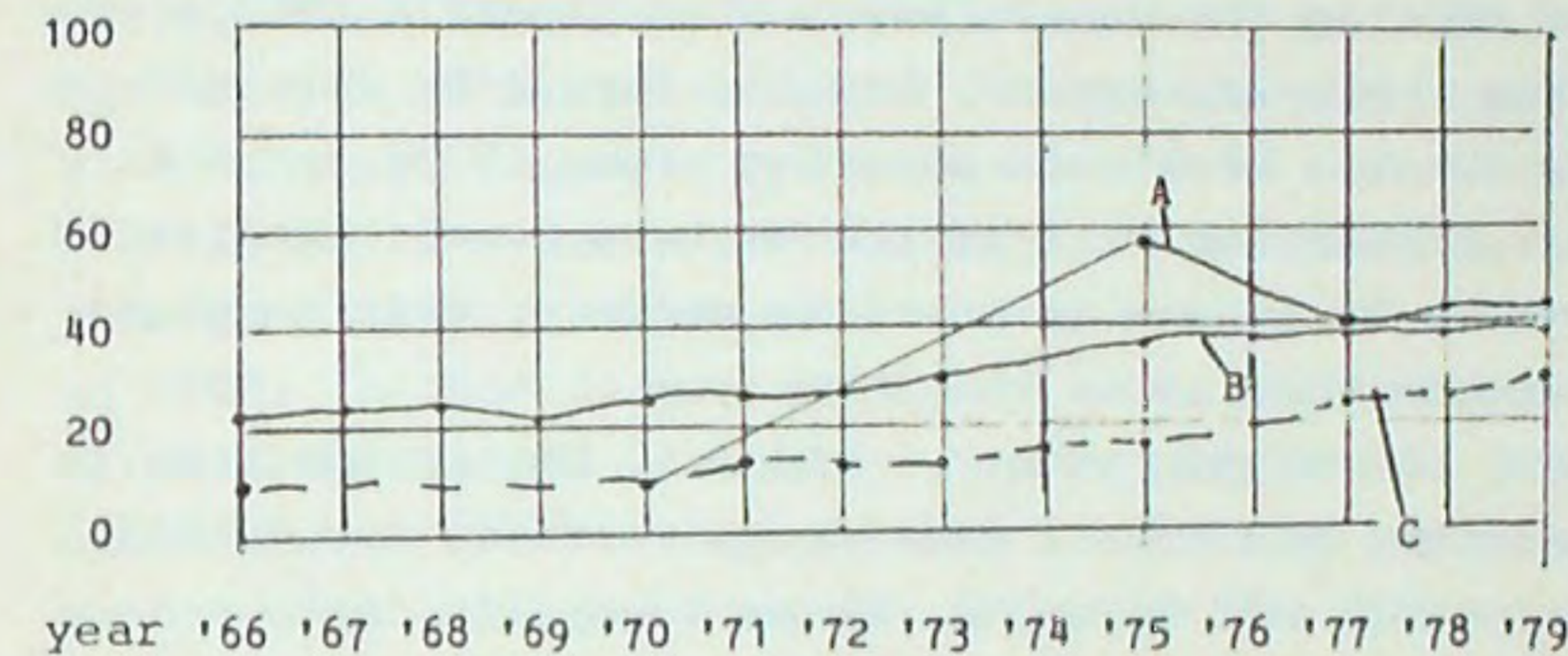
sources: Somali Democratic Republic: Current Statistical Trends in Somali Education, 1981
UNESCO: Statistical Yearbooks

Second, education and job opportunities continue to open up for Somali girls and women. The percentage of females enrolled in primary schools and teaching in those schools have been rising slowly but inexorably since the revolution. While no women hold high political office, more women are becoming exposed to the same opportunities as Somali men.

One could easily predict that in the coming decades, Somali women will play an increasingly important role in Somali politics.

Table 5. Social Progress - Some Trends (B)

Percentages



A = Enrollment ratios in primary education (gross enrollment as a per cent of population aged 6-9)
B = Female students in primary school
C = Female teachers in primary school

sources: Somali Democratic Republic: Current Statistical Trends in Somali Education, 1981
UNESCO: Statistical Yearbooks

That the Somali government has continued to expand educational opportunities for its citizens, and especially for females, is a fact that should not be lost in the current hot dialogue concerning Somali politics.

Somalia's Military Vulnerability

Up until the 1977-1978 war, the Somali government sought arms from foreign governments in the expectation that one day these arms would be needed to help liberate the Ogaden

from Ethiopian rule. In no valid sense was the present territory of Somalia itself threatened by a foreign power.

The situation is different today. Ethiopian troops, sometimes acting alone, and sometimes behind Somali dissidents, do constitute a security threat to the government of the Somali Democratic Republic. It is not inconceivable that Col. Mengistu will order a military assault on Somalia with the hope of turning the Somali Democratic Republic into a region of the Ethiopian empire. Regular forays by foreign troops into Somalia have been occurring since 1978; and Col. Mengistu has threatened that if the Western Somali Liberation Front continues to engage in guerilla warfare, that he might very well attack Somalia in response.

In July 1982, the Ethiopian army, aided by Soviet advisors, Cuban technicians and Somali dissidents captured the Somali towns of Balembale and Golgodob. These towns lie inside the internationally recognized borders of the Somali Democratic Republic, and they are presently occupied by Ethiopian forces. In large part because it was the Somali army that invaded Ethiopian territory first (in 1977), very few countries have protested against the military occupation of the Somali Democratic Republic.

The Ethiopian army could now, without any trouble, capture the only road that connects the north to the south. Once that is done, the Somali National Movement (the Isaaq dissidents working for Siyaad Barre's overthrow in Ethiopia) could march at the helm of a few Ethiopian divisions and occupy Hargeysa, and march on to Berbera.

It is by no means sure that Ethiopia wants to defeat Somalia militarily and then occupy it. More likely, Mengistu wishes merely to humiliate Siyaad Barre's government, making it pay for its aggression in the Ogaden. Nor is it sure that the Soviets would permit Mengistu to overrun Somalia. After all, it was the Soviets who were aghast when the Somalis defied the legitimacy of an internationally recognized border.

But whatever the true motives of Ethiopia and the Soviet Union, there is no doubt that Somalia will be facing a genuine threat to its national security for a long time to come.

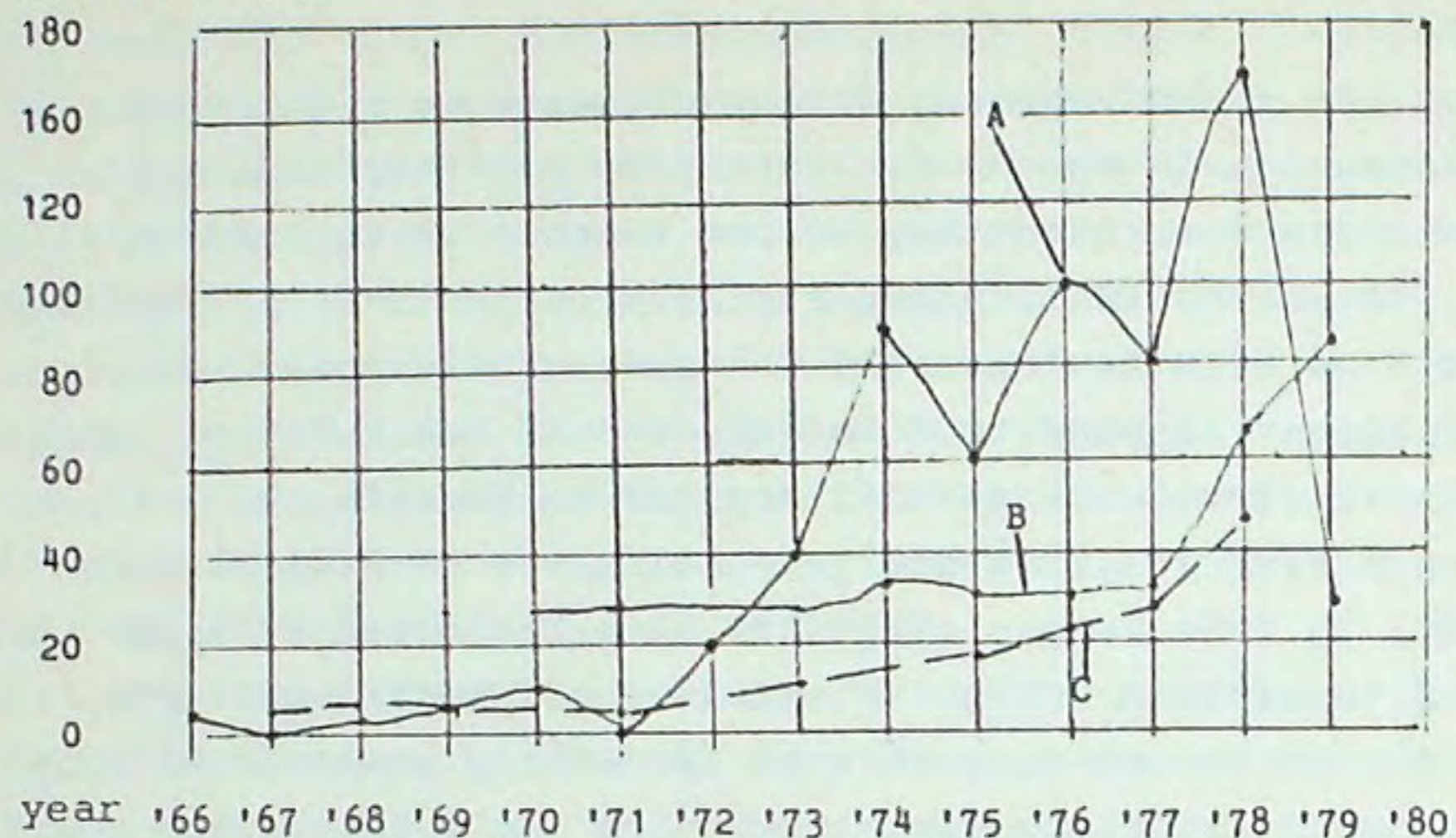
Somalia has therefore made urgent requests to the Reagan administration in the US for defensive military aid, and the American government has become responsive to Somalia's calls. After the lull in imports of arms in 1979 (reflecting Soviet ties with Ethiopia and Carter's unwillingness to give military support to Somalia), the US has budgeted significant increases in military aid to Somalia. US foreign military assistance to Somalia was US \$ 20 million in 1980; in 1984 Reagan officials have projected a figure of US \$ 40 million.⁴ Regular missions by Somali military officials to the US suggest that increasing pressure will be put on the Reagan administration by the SDR to raise the level of military aid.

In a related figure, the importation of transport equipment as a percentage of total imports has doubled in the past six years. This reflects the need to get supplies out to refugee camps. But it also reflects the need to build trenches on the present border to protect Somalia against an Ethiopian invasion. Table 6 demonstrates the progressive militarization of Somalia since the early 1970s. Even with the war over, one must project continued high military expenditures.

Future governments in Somalia will not easily be able to choose whether to prepare for the eventual liberation of the Ogaden (and therefore to buy arms) or to defer gratification (and therefore to stop buying arms). Somalia's territorial integrity is no longer secure, and this means that unless a political solution is found to end the conflict with Ethiopia, any Somali government will have to curry favor with a great power in order to procure sufficient weapons to assure Somalia's sovereignty.

Table 6. The Militarization of Somalia

Million US \$



year '66 '67 '68 '69 '70 '71 '72 '73 '74 '75 '76 '77 '78 '79 '80

A = Arms imports (current \$) B = Military budget

(constant 1978 \$)

C = Transport equipment (current \$ for imports)

sources: Paul Henze: Arming the Horn 1960-1980 (Washington), 1982;
UN Yearbooks of International Trade Statistics;
US House of Representatives, Subcommittee on Africa: Hearings and Markups

Conclusion

Somalia's political decision in the mid-1970s to mobilize for the ultimate liberation of the Ogaden changed the course of its revolution. It was a popular decision at the time, as most Somalis felt that with the demise of Haile Selassie, the Somali army would be able to capitalize on the ensuing anarchy to 'recapture' control over the Ogaden. Substantial

military progress in 1977 suggests that the Somali army was indeed well trained and that the war was well managed. It took massive infusions of foreign expertise, troops, and material to defeat the Somali armies.

The costs of that war have not been fully reckoned. They go far beyond soldiers killed and nomads turned refugees. In the wake of the military defeat, the scientifically socialist revolution changed its course. Saddled by enormous debts to the socialist world, the capitalist world and to the Arab states, Somalia's freedom of maneuver became severely constrained. Somalia's early movements into industrialization foundered; and increasingly, Somalia found itself again as primarily a supplier of live animals for rich pastoralists and hungry mouths in Arabia. Increasingly, Somalia has become culturally and economically dependent on the Arab world. Despite this, educational progress continued, and especially for Somali women. Perhaps the greatest cost of the lost war is that now Somalia is militarily vulnerable to attack, and must hook its wagon (and ideology) to a superpower in order to feel secure.

The spectrum of political choice available to leaders in poor Third World states is necessarily narrow. Since the shocks of the oil market and the Ogaden war of the 1970s, Somalia's spectrum of political choice has narrowed further.

FOOTNOTES

- ^I David Laitin presented aggregate time series data on economic performance in Somalia in "The Political Economy of Military Rule in Somalia" in: Journal of Modern African Studies (September 1976) and in "Somalia's Military Government and Scientific Socialism" in: Carl G. Rosberg/Thomas M. Callaghy (eds.), Socialism in Sub-

Saharan Africa: A New Assessment (Berkeley), 1979

- ² Somalia: A Country Study, Foreign Area Studies, The American University, H. D. Nelson (ed.), 1981, p. 286. Data culled from Central Bank of Somalia, Statement of Accounts, 1979.
- ³ Interviews and observations by author in Mogadishu, July 1980, and in August 1983. On the linkage of economic and cultural ties by Saudi Arabia, see Sulayman S. Nyang: Saudi Arabian Foreign Policy Toward Africa, in: Horn of Africa, vol. 5, no. 2.
- ⁴ See: Testimony of Chester Crocker to US House of Representatives, Committee on Appropriations, April 1983.

Nikolaus Schopfer

FINANCIAL PROBLEMS IN SOMALIA

Introduction

I. General Remarks

The contribution to this paper is mainly based on a few official documents, most of which are accessible to the public, e.g. annual reports of the Central Bank of Somalia (CBS), reports of the Ministry of National Planning (MNP) on the 3-Years-Development-Plan and on the 5-Year-Development-Plan, statistics and reports of international organisations. In addition, two years experience as adviser to CBS and to the Ministry of Finance (MF) may carry some weight.

This contribution is intended to identify and to highlight briefly some basic financial problems. It is not an academic exercise aiming at comprehensiveness and theoretical foundation. The paper takes into account points made in the discussion at the Hamburg congress.

2. Economic Background

Economic Structure: Most African countries are characterized by the dominance of the agricultural sector; peculiar for Somalia is the pastoral society, the high degree of nomadism obvious. This element is not very conducive to fast economic development, but in Somalia it is even gaining in importance. In fact, livestock contributes nowadays 37% to GDP (1981), in 1970: 27% only. By contrast, crop production has declined in importance: 1981: 7,5%, whereas it had been 18% in 1970; for bananas a similar trend was observed. Also manufacturing was higher, relatively speaking, eleven years ago (1970: 9% - 1981: 6%).

(Choice of the reference years (I970/I98I) may exaggerate the above picture somewhat, but the underlying trends remain basically the same if base- and end-period figures are averaged from I970/7I and I980/8I data.)

Economic Implications: Obviously something was going wrong in the development of the country, rather one would expect reverse tendencies. This calls for a better development strategy, better technologies etc. The new Public Investment Programme (I982-I986)(PIP) is dealing with these problems, but this is not my subject now. I may confine myself to the

Financial Implications: These comprise

- financing the development process;
- financing the economy generally (money and banking);
- financing the public sector (governmental financial problems);
- external financial constraints (balance of payments - BOP) including emergency programmes (refugees etc.).

Financial Problems

I. Development

Reviews of past development plans reveal a low rate of implementation. The reason is mainly: Too many projects are included in these plans with an overoptimistic high local funding. The new Five-Year-Development Plan (FYDP) seems to be more realistic: The total PIP foresees I6 bill. Somali Shilling (SoSh) to be spent during I982-I986 with 80% external funding (formerly 50%). The low rate of domestic saving is now recognized. Local funding is scaled down to a reasonable portion. Nevertheless, local counterpart funds from governmental budget, Development Bank of Somalia (DBS), etc. remain a problem (too many delays).

More emphasis is now placed on external financing: Once identified and approved by the foreign donors, financing of the development projects do not encounter many problems in the first stage. Later, of course, when the projects come on production stream, when they are handed over to local staff, and when repayments are due, problems arise including financial ones. Debt rescheduling may become necessary, even if projects are planned to yield debt service (which in most circumstances is very modest due to the soft loan character).

Another problem is typical for many development plans including the new FYDP: the PIP is based on constant prices. On a current price basis allowing for international inflation, the PIP is estimated to total S 2,3 bill. External funds contain a 40% grant portion, but there is a considerable "To be funded" (Tbf) gap both for local and external funds in view of the 20 : 80 proportion. Additional funds have to be raised what may prove to be difficult.

2. Money and Banking

Irrespective of special development financings, for normal economic transactions such as trade, production, traffic etc. money is necessary and for the growth of the economy credit and credit expansion is indispensable. How is the monetary situation in Somalia? If we look at the composition of (narrow) money, we find that about 50% and more of total money supply was cash in recent years. About ten years ago in the early I970s (before the revolution with subsequent Russian influence), this ratio had been about 40%. Moreover quasi money, i.e. time and savings deposits, make up a very small portion (less than 20%) of money in the wider definition. This clearly indicates a very low degree of monetization of the economy, even by African standards. Even though the Commercial Bank has about

40 branches all over the country and the Postal Savings System has about 60 branches nowadays, the degree of monetization has not increased thus revealing a hesitance of the people to entrust their money to the banking system.

(Everybody who stays for some time in Somalia knows about this problem.) People would carry bundles of ten and twenty shilling notes around (often the 100 shilling notes are not available), rather than placing money on bank accounts and paying by cheque. Partly this feature is rooted in tradition, but in my view it is mainly due to the inefficiency of the local banking system. As long as the banking system is inefficient, the economy can hardly gain in sophistication and productivity.

3. Public Sector Financing

Public Enterprises (PEs): It is well known that many PEs are not functioning well. Probably socialisation has gone too far. The recent privatisation of three public agencies indicates that the government has realized this fact. Moreover too many PEs are run by people who lack sufficient qualification (e.g. military people as compared with merchants, engineers or economists).

The consequence is financial misconduct. Many credits extended to PEs have not been repaid in time, partly banks (Commercial Bank, DBS) had to write off such loans. We see the interlinkage of financial problems on the banking side and on the side of PEs (and last not least for government budget). Quite often the accounting system is insufficient and does not enable timely monitoring of financial flows. Budgeting and financial planning is often based on unrealistic data and does therefore not give guidance for the financial conduct of PEs. Recent efforts

to intensify the unified accounting system in PEs may raise hopes in this regard.

However, improvements are not in sight as long as PEs (and banks) are not run on sound economic principles such as prudence, solvency, profitability, efficiency etc. and as long as the government interferes in important entrepreneurial matters such as fixing of sales - or of purchase-prices, employment guarantees and even employment orders.

Government Finance: In recent years the finances of the government were troubled by fact that expenditure grew faster than revenues thus opening up an "ever" growing financing gap (since 1979 even in current accounts). Partly the government managed to obtain funds from abroad, partly the government resorted to the local banking system, in Somalia this means to the CBS. Especially in the late 1970s, CBS financing soared rapidly peaking almost 1 bill SoSh in 1979. Overall financing deficit was running as high as 10% of GDP (which is very high by any standards). To the extent such CBS funds are used for domestic expenditure of the government, too much money was injected into the economy, thus fuelling inflation. In fact, the inflation rate in Somalia peaked 59% in 1980 on average (with over 70% annual growth rates in some months).

Meanwhile the government launched a stabilisation programme in cooperation with the IMF that successfully brought down inflation rate to about 24% in 1982. However, budget deficits are still large and the government will have to take further action on two sides with the view to reduce overly high CBS financing:

- revenues: The taxation system is presently marked by a very high portion of indirect taxes (mainly customs duties). This adversial structure would improve without

special measures, if (with some liberalisation) more companies would be enabled to operate profitably thus yielding profit- and incometax payments. Moreover profitable enterprises are able to expand business and create new jobs getting more people to pay wage tax. But there is also scope for a moderate saletax;

- expenditure: I do not want to discuss the budget allocations to the ministries, which is essentially political in nature. From World Bank publications it is known that Somalia ranges among the highest in Africa in terms of military spending. More important from a (macro-) economic point of view is the overall size of the budget and its annual growth.

Beforehand the overall budget is always balanced. But the present system of expenditure control is insufficient; it is more or less bound to produce deficits. In fact, booking and accounting procedures lag far behind actual transactions and payments. At present there is no satisfactory system of properly analysis and evaluating the expenditure performance and the total financial position of the government on a current basis. Growth limits and other limits are often not observed.

4. External Financial Problems

From Somalia's Point of View: External relations are characterized mainly by low exports and very high imports. In the early 1970s the relationship between imports and exports was about 3 : 2; until the late 1970s / early 1980s this proportion has deteriorated to almost 4 : 1. Consequently the trade deficit jumped enormously reaching a maximum of 2.1 bill. SoSh in 1980 (incl. services). How has this fast growing gap been financed?

- To the extent commercial imports exceeded exports mainly by official reserves which consequently depleted largely

(1981 the reserves were only good for about one month imports, the normal requirement is about three months imports);

- imports for development purpose were mostly financed by official loans and grants from abroad. They counted for almost 1/4 of total imports;
- food aid for refugees has been funded from official grants which made up over 1/4 of total imports;
- until 1981 Franco Valuta (FV) imports changed in importance (between 30% and 10% since 1978).

The above enumeration does not place enough emphasis on the difficulties to obtain such funds. Hence two problems have to be dealt with:

1. to reduce the trade gap;
2. to finance the residual gap appropriately and even to rebuild a modest reserve cushion.

The first problem has to be tackled by means of an adequate trade policy, e.g.

- to foster export and export oriented production (fish, bananas, etc.). This policy has to be in line with the development strategy;
- to control imports prudently (and not arbitrarily as presently quite often) and to reintroduce FV.

As regards financial requirements (the second problem), the government has already introduced some incentives, e.g. \$ accounts for livestock exporters and Somalis abroad and time deposits in \$ "with internationally comparable interest rates". However, the implementation of such measures requires more professionalism. The government must make clear that it is really serious about its policy. I will come back to the second problem in the final chapter.

Constraints on the Donor's Side: From a Somali point of view it may appear that unlimited funds are available abroad

just waiting to be tapped and to be channeled into the country. But a brief review of the potential sources reveals considerable constraints on the donor's side.

Funding problems of international organisations, especially the IMF: The recent (almost 50%) increase in IMF quotas has already been dished out largely (even though not yet formalized). The IMF is encountering problems to fulfill its commitments. Shall the IMF go to international financial markets? I foresee difficulties if the IMF does not adhere to the fund principle. The Fund is designed to do short-term BOP financing only. Otherwise the IMF becomes dependent from the vagaries of international financial markets. IMF commitments may have to be cancelled. IMF funds may become more expensive. World inflation may be fuelled.

World Bank (plus subsidiaries): The 100% capital increase 1980/81 has made available funds of 60 bill. \$ for five years. But there are funding limits, especially on short-term money markets. The World Bank would be most welcome as a borrower by Euro-banks. The consequence, however, would be rollover credits on the lending side, a very questionable source of financing long-term projects for LDCs.

Bilateral Aid: Because of serious budget problems in most of the industrial countries, there are heavy constraints on all budget categories including development aid. In West Germany ODA forms about 2,5% of the government budget (formerly less!) and 0,4% of GNP. The norm for industrial countries is 0,7%. But total flows including private capital to LDCs are over 1% of GNP, i.e. more than the norm for industrial countries. So on the whole Germany contributes a fair share to LDCs (and Somalia is one of the more favoured countries).

5. Conclusion

To solve the problems described above, policy makers must work on two fronts:

- a. More efforts are necessary to facilitate the internal adjustment process of the economy generally and in the financial sector especially. First, the insufficiencies of the institutions (local banking system and public sector) must be addressed. A lot can be improved with more and better training of bank staff. However, such measures will only be effective, if motivation and efforts of staff will be honoured, in other words, a more achievement oriented wage system is indispensable. The same applies to the public sector staff in general. As long as staff is arbitrarily up- and down-graded, or put on jobs for which they are not trained, there is little dedication to work. The other side of the coin is that bank customers, borrowers as well as depositors, and tax payers don't feel themselves well treated and try to avoid (and even to escape) the relevant institutions.

An atmosphere of confidence will only arise if the government strengthens its major institutions and creates stable economic and financial conditions. In this case Somalis abroad may feel encouraged to invest their savings locally and to place money with the domestic banking system. There are substantial private funds to tap which, if utilized, would solve most of the BOP problems. Probably a foreign bank with more expertise in this type of services is needed to raise skills and more sense of professionalism in the sensitive financial sector.

Second, the government would be well advised to follow more consequently the adjustment policies it has worked

out together with the IMF and to which it has committed itself. In the financial field this means mainly to reduce the amount of the government's borrowing from CBS and to control government's expenditure more effectively.

- b. It is of tantamount importance that in case of better policy performance the country will not only receive official assistance from abroad (the other 'front' mentioned above), but it may also open up lines to private financial sources. Recent international developments indicate that the IMF's "seal of approval" is even gaining in importance and that for instance international commercial banks tend to make their engagement conditional of the IMF's own engagement in a LDC. In any case, if the government pursues a convincing economic and financial policy which should include some more liberalisation, more public and private funds (not least from Somalis abroad) will be available to the country. In this case also private foreign investors will find it more attractive to launch projects in Somalia and to channel funds into the country (see the successful development policies of LDCs like Singapore or Malaysia).

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Accelerated Development in Sub-Saharan Africa

Annual Reports

Abdulkadir H. Deriye

ECONOMIC DEPENDENCY, ITS CULTURAL ORIGINS AND ITS
CONSEQUENCES FOR SOMALIA'S DEVELOPMENT

Thesis

Somalia is reputed to be a chronically dependent economy. From the viewpoint of the country's internal dynamics, this is so in large part because it is a society which is marginally based on labour and production, against a backdrop of slender material resources which can be exploited only with imagination and effort. Accordingly, the country's national income and standard of living are very low, and likely to remain so in perpetuity unless it undergoes profound institutional changes with regard to both cultural outlook and economic organization. The aim of this paper is to investigate the nature of this socio-economic dependency, its cultural roots as well as its negative repercussions on the country's development.

It is common knowledge that people of nomadic origin constitute the bulk of Somalia's population, generally leaving their permanent stamp on national institutions, and significantly influencing the character of social existence as well as the course of developmental change, in a manner consistent with their traditional dominance. Accordingly, it is opportune and necessary to look upon nomadism as the primary source of Somali national culture. At any rate, as shall be demonstrated, the worst excesses of the problem of dependency at least can be attributed in large measure to the peculiarities inherent in a nomadic life style. Nonetheless, it should not be overlooked that strong traces of economic dependency are evident throughout the Somali

countryside, whether pastoral, coastal or agricultural, due to the climate of demoralizing poverty which acts to dampen initiative, hinder material accumulation and thus breed economic determinism.

Perhaps what distinguishes pastoral-originated dependency from other types, and therefore renders it more rampant as well as intractable, is that it is, paradoxically, imbued with a restive ambition in its impatience to break away from the constraints of poverty by any means possible. And this tendency acts to compound, rather than relieve, the problem. For the methods employed to deal with it are often unorthodox and, in the end, counterproductive.

The indicators used in this paper to examine the manifestation of dependency in the Somali culture are simply the prevailing negative attitudes toward such factors as work, production, consumption, time, income, money, etc. An attempt will be made to link these attitudes with the phenomenon of dependency to which, it is argued, they inevitably give rise. Moreover, it will be seen that in the process socio-economic development becomes an obvious casualty of such systematic dependency.

The Vicious Circle of Nomadic Life

The nomadic way of life is notoriously harsh and brutal, due to the extreme scarcity of water and grazing resources in desert habitats. The nomad spends most of his time, not on productive activities designed to improve his standard of living, but on purely survival chores as he shuttles with his family and stock from one watering spot and grazing site to another. In other words, he spends a considerable portion of his time, especially in the dry season, practically running for his life. In such an environment demanding the capacity for sheer physical survival, he does not possess

the material wherewithal to accumulate resources or raise the basic physical infrastructure on the desert necessary for a better life in the future. For the delicate structure of the pastoral ecology does not permit of such opportunities. Indeed, the Somali nomad hangs on to existence by a bare thread. His life is both brutal and short. Under these static circumstances, the nomad's spartan migratory efforts are motivated less by a driving ambition to improve his economic lot and quality of life (much as he would wish to), and more by a compulsive instinct to remain alive against overwhelming odds. This is an important distinction, for the nomad's daily activities are not much geared to any process of structured production with its calculated potential for accumulation, but are rather governed by the rules of basic subsistence - with a minimum of value added embodied in his labour. He is, in other words, operating within a recurring cycle of subsistence and survival between the rainy and dry seasons. Thus in short, nomadism, at least in the Somali context, is a life-maintaining rather than a productive system. And this is as much as to say that, by its very nature, it militates against material progress.^I

Even so, desert dwellers highly esteem their way of life. For all its other shortcomings, what endears nomadism as a full-time pursuit (in contrast to cultivation and fishing) to the Somali nomad is that it affords him personal autonomy, if not economic prosperity. It is freedom of movement and personal liberty from extensive institutional interference that he values above all. And in this he finds positive reinforcement in the romanticism of the desert. Moreover, despite the privations of pastoral existence, the nomad enjoys considerable leisure time once the long treks are concluded, especially during the rainy season. This is particularly true with regard to adult males, since the

bulk of nomad subsistence labour is performed by women and adolescents.² Abundant free time, which is an inbuilt feature of the nomad's personal autonomy, permits him to engage in his favourite leisure activities. Foremost among these activities is oral poetry in its various forms and expressions. And it is assumed that creative poetry, particularly the genre most popular in Somalia (the epic 'gabay') requires considerable reverie and reflection (i.e. autistic thinking) to flourish, and is ideally perfectable under conditions of extended disoccupation. Indeed, its wider proliferation in the nomadic setting than in the agricultural communities of Somalia bears the testimony to this assertion. (On the other hand, compare this with the institution of 'poet-in-residence' in American universities whereby the chosen poets' leisure is financed to aid their creative efforts.) Besides poetry composition and recitals in competitive circles, other pastime activities favoured by the nomads include folk-dancing, story telling, riddle solving games, information exchange, clan politics and news of the outside world - all in a ritualistic manner impervious of time.

It is no wonder, therefore, that by modern standards such wide spectrum of leisure activities perforce involve a great deal of loitering, idleness and waste of time. But time within the tradition-bound nomadic frame of reference loses the great value attached to it in the high production-oriented societies, with their hectic pace of life in pursuit of economic ends. Since economic progress cannot be rationally envisaged by nomads who are trapped by the bare survival conditions of the desert, time does not acquire the magic attributed to it by modernized societies. Indeed, the management of free time which offers itself in an endless stretch poses a burdensome dilemma for the average nomad as well as for many people in Somalia's urban centers

who cannot or would not utilize it productively. Thus, the most distressing aspect of the non-productive utilization of time in the nomadic background is, as a deeply ingrained habit, that it has been carried over to the modern sector with an undesirable effect. We shall see later how this poor perception of the value of time conspires with other unorthodox tendencies to broaden the dimension of dependency and thereby weaken the nation's work ethic.³ Suffice it to conclude this section by pointing out that the Somali nomad's attitude toward life is basically existential rather than developmental, in the sense that he places greater stress on the intrinsic value of leisure over the utility of work. And, obviously, this attitude is in itself environmentally determined.

The Nature of Dependency in the Pastoral Sector

Predictably, the principal cause of nomadic dependency is the average nomad's extreme poverty which denies him the opportunity to break away from its vicious circle by means of accumulation and economic diversification, since the carrying capacity of the pasture lands together with periodic droughts place a limit on the size of his otherwise naturally multiplying herds, and as a result repeatedly frustrate his economic ambition by keeping him permanently poor. Indeed, the very onset of hard times themselves serve to dramatise the extent of the nomad's dependence on his livestock, which are his only means of livelihood, and which have historically helped to deliver him from assured starvation during climatic adversity. On the other hand, it is important to point out that the nomad subsists not so much on the product of his labour power, but on the natural increase of his stock (which is freely provided by nature).⁴ Unlike peasants and industrial workers who apply their

labour to other factors of production in order to create new value, the nomad tends his stock in a relatively passive manner and lives off their produce. This is another significant dimension, for it underlines further the nomad's extreme reliance on his herds that require a modest expenditure of programmed manual labour on his part. In addition, the process of production involved in animal husbandry is far simpler than in either industry of farming, since it incorporates a simpler division of labour. So is the work discipline less strenuous in the case of nomadism which evolves mostly around trekking with the animals, and besides daily subsistence milking, occasional processing of their by-products such as hides, skins, 'ghee and meat. All this amplifies the nomad's low productivity engaging a fraction of his potential labour power. It is therefore not surprising that because of his acquired disdain for manual work, he is humorously labelled as an 'impoverished aristocrat', even if he tirelessly covers a wide territory in search of grass and water. Yet, such a remarkable effort cannot be included under the category of 'conventional labour' having a finished product as an end result. Nor does the nomad's primitive technology allow him to improve significantly the quality of his animal husbandry.

It should be noted, then, that in the light of these pressing circumstances, the Somali nomad is usually a victim of the deep physical insecurities attending desert life, being constantly at the mercy of unpredictable weather conditions which could wipe out his stock and endanger his own life, producing in him a certain psychosis. Yet, his greatest frustration is centered on the fact of his negligible material progress despite his unending aspiration for it, due to the barren desert conditions which stifles the chances of progress. These twin considerations, always present in his mind, tend to colour his worldview as well as the nature of

his social behaviour, often forcing him to invent ingenious ways to ensure his security and achieve some material gain in the process, so as to escape permanently from the spectre of poverty. Indeed, this consciousness of enveloping poverty constitutes the central issue in the nomad's life. And as a symptom, it is crystallized in the nomad's endless preoccupation with it and his passionate search for avenues to escape it.

Being reduced to a state of continual need, the nomad, despite his personal self-esteem, is ruled by the conditions of his poverty, which often dictates his attitude toward others. For he is frequently placed in a position that impinges upon him to seek ways to improve his lowly standard of living and alleviate his poverty, and he therefore finds it inescapable to solicit aid from relatives and friends who are in a position to provide it. But by so doing the nomad is obliged by necessity to establish, even if subjectively, some kind of dependent relationship with his benefactors based on a protocol of deference, even though he is loathe to it (being jealous of his personal autonomy). (It can be imagined that such jealousy is liable to create a conflict of loyalty in the nomad's mind, which makes his genuine gratitude for aid received sometimes questionable. But this is going beyond the scope of this paper.) Nonetheless, the plain fact is that he is habitually in a state of physical want and is forced by circumstances to seek and accept aid. Consequently, in the course of time this bent for want satisfaction through appeal to external aid has achieved the status of social norm among the population, where close economic interdependence is a common feature.

Yet, in so far as the nomad obtains charity in a peaceful manner, it can be said that he is operating within a legitimate framework to achieve his end. However, on occasions he is liable to use illegitimate means such as force or

fraud, especially if he can do so with impunity or feels that the method of straight-forward appeal does not pay. Traditional looting of stock, which used to underlie most tribal conflicts, can be cited as a resort to this form of extra-legality, just as misappropriation of public funds is another more refined manifestation of the same phenomenon in modern times. They both point to the underlying preoccupation with economic security. Accordingly, the dependency motive reflected in them, whether peacefully or violently expressed, is widespread in the Somali culture, and is undoubtedly inspired by a deep sense of privation coupled with a desire for economic self-improvement on the part of the affected individuals.

It can be concluded from the foregoing that what actually continues to institutionalize the dependency norm is that most individuals, whether nomadic or otherwise, have extremely low incomes.⁵ This means that their consumption requirements constantly run ahead of their personal resources by a wide margin, particularly in view of the low level of overall domestic production as well as of productivity (per person).⁶ And it is this continuing wide gulf between production and consumption which tends to feed the dependency syndrome, both at individual and national levels. As modernization spreads and consumer demand associated with monetization of the economy grow amid stagnant production, so does this gulf widen and the thrust of dependency acquires problematic proportions. On the other hand, the demonstration effect implicit in modern consumer habits worldwide obviously acts to throw the contemporary Somali individual's own sense of comparative privation into bolder relief, making him a greater prey to the pull of dependency.

The Benefit Principle

Perhaps the most concrete representation in daily life of the dependency syndrome is what may conveniently be called 'the benefit principle'. This describes the cast of mind shaping the attitudes of many people in this environment as they go about the business of earning their living. For the benefit principle urges the individuals persuaded by it to habitually seek easy economic windfalls, including outright donations, and be constantly on the look-out for similarly lucrative sources affording handsome pay-offs. However, the economic benefits received in this manner usually involve no conventional labour in exchange. Obviously, since the division of labour in the Somali economy remains relatively simple, part of the problem is due to the general lack of occupational skills and business opportunities on the part of these benefit-seekers which can conceivably bar their way to legitimate employment. At any rate, a whole stratum of individuals have gradually evolved who show a marked preference for this labour-free route to subsistence and who display a remarkable virtuosity at its practice.

It should be noted that in the traditional Somali nomadic culture, the institution of wage employment (on the basis of payment either in cash or in kind) related to measurable (set piece) production is virtually unknown, due to the absence of mature division of labour under communal subsistence conditions. Thus historically no cultural link was established between work and income generation in the Somali mind; and this institutional dislocation was carried over to the modern period as well. Today, inspired by the benefit principle, there are far too many people who receive incomes or quasi-incomes without necessarily contributing any labour in exchange, or feeling the obligation that they ought to. Typically, they obtain their daily remunerations

from derivative side activities which constitute an additional surcharge on the actual output taking place in the economy, which itself regularly lies below its production possibility curve. Thus, the economy finances numerous shadowy activities which touch on national production only marginally, or have no relation to it, and in this way produce a peggy-back effect on national resources. This large army of non-producers somehow manage to receive a fair share of national consumption, even though they live off their wits and survival instincts rather than their labour power. They tend constantly to improvise ingenious but relatively effortless ways to earn their living and even prosper, including soliciting aid as in the traditional manner. In other words, they carry on, in one form or another, the time-honoured norm of dependency in the Somali culture. In this sense, there is not only evident contempt for the dignity of work, but also a parochial disregard for its value in bringing about social progress. Indeed, this overly casual treatment of work brings into serious question whether the spirit of development as an objective philosophy has yet been fully internalized by the mass of people.

The benefit principle, so defined, is clearly a social problem in its parasitical aspects as well as its compulsive character. And being brought about by need in the first place, it has also snobbish over-tones. For the inveterate benefit seekers are lured as to a magnet by the economically powerful around whom they cluster in dependent relationship, with expectation of benefits trickling down to them in proportion to their attachment to the symbols of economic power. This explains in part the large informal following usually enjoyed by the wealthy. Similarly, institutional authority seems to derive much of its marked influence from the effects of this mechanism.⁷

At present, this phenomenon of regularly extracting easy

benefits at least cost is so widespread as a cultural norm that it has become an informal welfare system supported, as a necessary evil, by private individuals and public institutions alike. Moreover, it is popularly viewed as a kind of social arrangement for income distribution on a casual basis, whereby the flow of these benefits represent an unwritten social tax chargeable on wealth differentials. As such, it is kept alive by the twin factors of economic insecurity and the traditional customs of communal socialism that, under pervasive scarcity, obliges community members to share what they have at the risk of social ostracism.

An objective examination of the benefit principle reveals its wasteful ramifications for the national economy, and by implication the wider task of nation-building which it tends to undermine. For there are far too many claims on national resources which are not offset by commensurate inputs of labour and social services. In other words, a social climate is bound to materialize wherein almost everyone has some economic axe to grind, but only a few are willing to contribute the necessary sacrifices. As a result, there is bound to be a serious discrepancy between the sum total of the rights claimed and the duties actually performed within the body politic.

Easy Money and Negative Savings

Having stipulated the divorce which had traditionally taken place in Somali culture between work and income generation, subsequently giving rise to the so-called benefit principle, it is necessary to treat a corollary to this phenomenon, namely the concept of easy money.

In the first place, the practice of thrift and saving seems to be totally at variance with traditional Somali attitudes. The reason is apparently simple and resides in the fact

that the nomadic environment, operating as it does on a low level of subsistence, furnishes the Somali nomad with a minimum of worldly possessions which leave him with practically no surplus for saving and accumulation. Similarly, opportunities for investment and technical innovation under these dismal conditions are all but negligible, and are submerged in the struggle for life. Under these circumstances, a life of material plenty is considered a remote possibility that occurs only in the nomad's day-dreams. Thus, wealth came to be endowed with dramatic fairy-tale qualities in its elusiveness as a desired object. When, therefore, a sudden windfall of wealth is obtained by whatever means, the bounty is quickly spent with festivity and fanfare, being viewed as a rare gift that should be fully enjoyed while it lasts. And it is from such fleeting tastes of the pleasures afforded by brief experiences of wealth which, in the nomad's mind, came to equate wealth over time with the ticket to the enjoyment of life, and not with the possibility of conserving it for future use. A developmental interpretation of wealth, being such an abnormal occurrence, must have been considered impracticable and self-defeating in the barren desert conditions. Thus, an economic ideology of maximizing satisfactions came gradually into currency.

In the burgeoning cash economy, such interpretation of the essential significance of money (which is a symbol of wealth), remains popular among the economically less sophisticated Somalis who are in the majority. For money appears to be still perceived, besides the initial satisfaction of basic needs, mainly as the key to the enjoyment of life's amenities, and not as the path to economic progress through the medium of saving and investment. In other words, instant consumption is given by far greater priority over capital formation, which necessarily requires foregoing some current consumption in favour of productive expansion.

This traditional concept of money finds greater confirmation in the fact that, according to the Somali worldview, attainment of wealth is believed to be not so much the result of thrift and hardwork, but more or less as a game of chance, a matter of good fortune. And this gives added emphasis to the existing psychological wedge between work and income generation already discussed. As an economic worldview, the Somali attitude may invite comparison with Max Weber's comments on the alleged Protestant ethic, which happens to be diametrically opposed to our model.

It should now be apparent that in the Somali context, money and wealth are desired for their own sake, but are divested by default of their time value by investing them with little developmental significance. As such, this attitude begs an obvious link with the above mentioned benefit principle. For as we have seen, the benefit principle cultivates the propensity for easy access to resources without worthwhile effort in the process qualifying their use - testifying to the presence of a fundamental split between labour and income acquisition. Furthermore, this problem was compounded with the other problem posed by the doctrine of easy money with its open disregard for the time value of money and its bias for instant consumption at the expense of thrift and capital formation. Eventually, the two phenomena came to reinforce one another to produce a climate inimical on the one hand to productive wage labour and to saving and investment on the other. Obviously, for a poor country presumably striving for economic growth, such retrogressive forces unconsciously operating within its economic structure is detrimental to its development. As a footnote, it is safe to assume that the high velocity of money circulation evident in the national economy is probably fueled in large part by the spending sprees so common among the majority of the population. And it is instructive to note

that the most popular rationalisation put forward to justify such spendthrift habits is the presumed existence of a mysterious recycling mechanism, whereby any amount of money lavishly spent has a way of somehow coming back as an income. Obviously, this is an illusory if self-serving notion to mask a bad habit. On the other hand, mere evidence of rapid cash flows is often erroneously interpreted as a sure sign of brisk economic developmental activity. Both the benefit principle and the doctrine of easy money have, among other factors, contributed to the corruption prevailing in the public sector as well as to certain malpractices in the private sector.

Corruption in the Public Sector

The state is not only the largest employer in the Somali modern sector, but is also, for obvious reasons, the most powerful organization in the country. Besides, it is the acknowledged national agent of developmental change, and therefore the center of a great many activities of direct consequences for all members of the public. For these reasons and others, it has since its inception attracted considerable popular attention and interest. In particular, its economic power was found to be both impressive and attractive, with a certain touch of charisma. At one time, employment with the government carried with it the mark of high prestige, and was therefore quite fashionable. In short, the power and prestige of the state and its bureaucracy had the effect of capturing public imagination, particularly since 1960, in part due to the well-noted phenomenon of rising expectations associated with independent statehood.

Favourably impressed with the economic power of the state,

and in addition being driven by the possessive appetites of the benefit principle, many people both inside and outside the public sector could not refrain from coveting its overflowing financial resources, and actually planning to secure ways of usurping them whenever they were in a position to do so. Moreover, the peculiarly uncompetitive salary scales in the public service against a backdrop of rising prices paved the way to the gradual erosion of public accountability. Meanwhile, the tendency for high spending, growing out of the depreciation of the time value of money as a potential source of productive capital, further fueled the desire for misappropriating public funds in most cases.⁸ In sum, it was a combination of such pressures which had precipitated the current high incidence of corruption in the public sector, and led to the incidental weakening of administrative control machinery in order to serve that end.

Eventually, the public sector has, by common acknowledgement, become a vast welfare system that wittingly or unwittingly caters to the dependency drives of a large army of privilege seekers. In some ways, it is also a virtual relief camp where numerous households receive unofficial economic support in one form or another, and at times irrespective of administrative regularity.

Relief and welfare of this nature may take a variety of shapes, the most notable of which include the following:

- featherbedding: this came about basically as a result of declared government policy of mass employment of educated manpower as well as progressive elements in force since the early 1970s. Predictably, this non-selective policy resulted in flooding the gates of the public service by growing streams of fresh recruits each year. Even allowing for the fact of currently high turnover from the service, this policy is untenable in the

long run, for already at this stage the government's wage bill accounts for about half of its ordinary budget. Nor can it be defended on the grounds of its positive impact on the public economy and social services, since productivity and performance on the job in the public sector are notoriously low due, inter alia, to the serious under-employment of its human resources. In other words, the state, by adhering to its present employment policy, is thereby committed to subsidize a large contingent of excess labour as a matter of principle even when their services cannot be usefully absorbed into an already over-blown public service. As a consequence, this practically redundant manpower on the government's payroll constitutes a burden on the economy, and provides a convenient outlet for the dependency complexes of many nominal employees who are in search of senicures and padded expense accounts rather than productive public careers;

- graft: this issue goes beyond the mere fact of padded expense accounts and minor financial mismanagement inside the national bureaucracy, and points towards the systematic misappropriation of public funds under variety of administrative exigencies. As a phenomenon, it can be traced originally to the breakdown of the motivational system within the public administration, which suffered badly as a result of persistently poor pay conditions in the civil service. The wage freeze effective from 1970, with minor cosmetic upward revisions since, has worked to alienate many public employees from their careers, and began to erode their commitment to their official duties - particularly in view of the absence of an effective evaluation machinery for promotion within the service. In time, self-interest displaced public interest, and cynical self-improvement became the chief motive of many public employees who felt that they were over-worked and underpaid

(in dissonance with the socialist work ethic in vogue). This was particularly disturbing, since employment with the government was traditionally considered a privilege open to a selected few (before it was democratized by the Revolution). Typically, however, a public employee supported a large number of dependents, and jobs in the civil service were jealously guarded by the majority of their holders who faced probable unemployment in a small and crowded labour market should they leave their position. Thus the need arose for those employees who dismissed the emigration option to bypass this dilemma by open resort to corruption in order to supplement their declining incomes.

- To be sure, graft in government, before becoming widespread as a result of worker demoralization, was well-known to the minority of seasoned officials who had pioneered and refined its practice. For it was a commonly accepted dictum among many high officials that such graft was the road to easy money and comfortable life. And for the more ambitious in that category outright misappropriation of public funds constituted the shortest way to raise commercial capital on retirement. Indeed, many successful businessmen are known to be graduates from top ranks of the civil service, where they had acquired both administrative skills and generous working capital. Thus, graft, to the extent that it operates as a source of illegally gained easy money either for immediate consumption or business purposes, is tantamount to a form of usurpation emanating from the spirit of dependency already defined. For such wealth is amassed at public expense, with no exceptional compensatory effort justifying its acquisition;
- the intrusion of private interests: there is, notoriously, an unwritten symbiotic relationship between numerous

private businessmen and public officials engaged in corruption, mostly running their smooth rackets on the basis of mutual benefits for all concerned. For a long time, many people outside the public sector felt deeply impressed by the relatively great wealth of the state (in an ocean of poverty), and have ever since contrived to receive a good share of it by any means, in order to bolster their economic positions. Unscrupulous traders, who were habitually after easy money, saw abundant extra-legal opportunities in the public sector, and skillfully went about exploring avenues to exploit them. In time, they succeeded in making inroads into the nerve centers of the national bureaucracy, mostly by forging clandestine and mutually advantageous ties with willing and sympathetic officials who displayed a similar taste for easy gain. Thus, over the course of years, there has developed a number of elaborate networks designed to usurp within the fragile administrative process, the sprawling resources of the state. Here, too, we have a case of a large category of unearned income and therefore an evidence of the dependency syndrome.

Speculation in the Private Sector

Traditionally, commerce held a special lure and promise for most sophisticated Somalis who deemed it as the worthiest of all professions in the cash economy. This was partly as a result of the influence of their Arabian neighbours across the Red Sea, with whom the Somali coast had historically maintained extensive trading contacts. On the other hand, trade was found to be doubly attractive on account of its being a flexible free-wheeling activity with no overly concrete specifications, rigorous physical schedules or time consciousness, as in agriculture or industry; and this

perfectly suited the Somali nomadic temperament which accorded time low value and abhorred manual work. From these attitudes and influences, trade as a profession acquired magical qualities in the Somali mind, which came to regard it as the royal road to wealth and social prestige in the modern sector.

Due to its exaggerated reputation, trade attracted hordes of practitioners, big and small, who had little regard for other occupations, least of all farming and fishing. Thus, trade was engaged in at all levels, ranging from large wholesale establishments (now mostly in the public sector) to the numerous informal sector retail outlets. As a result, trading activities began to weigh down heavily on the narrow Somali market, slowly upstaging other more productive sectors, particularly agriculture and infant industry, both of which show potential promise of growth. In the end, this massive drift toward trade, as the golden profession, was bound to instigate inevitable abuses as uncontrolled competition was unleashed on a limited market. And in turn, these commercial abuses invariably gave way to speculation and monopolistic hoarding. The decline of the commercial ethic was further aided by institutionally-induced commodity shortages and supply bottlenecks as a result of bureaucratic inaptitude - thus providing greater impetus to speculative activities, and finally giving birth to a full-fledged black market. This black market spawned a second underground economy so pervasive in the commodities market that it led to the virtual breakdown of the pricing system, leaving the state powerless to check its growth.⁹ Today, the black market has become a way of life for a whole stratum of the population and provides illicit employment to a growing army of petty traders and small time street corner operators who are conspicuous in the main cities (and in defiance of municipal authorities). For the black market

emerged as an alternative source of large-scale employment in an economy of rapidly growing population in the cities, due to migrations from rural areas. And the elimination of the black market will introduce the problem of having to substitute the income of those who live off it with other means of livelihood.

With its artificially high prices, the black market is a heavy burden on the national economy, and plays havoc on the average consumer who, being exorbitantly charged, sees his purchasing power decline on a daily basis. Moreover, the economic gains obtained from speculative activities are not the fruits of either entrepreneurship or productive effort. On the contrary, by the skillful manipulation of commodity shortages, these gains are derived from selective hoarding and the disruption of normal distribution channels, both of which are harmful activities which contribute nothing to total output or capital asset creation, but are rather obvious drains on existing limited resources. Indeed, the dependency syndrome lurks beneath this deflection of the trade purpose, in the quest for easy money with a minimum of effort.

The Explosive Growth of the Tertiary Sector

The phenomenal expansion of trading activities over the past several years was part of a broader trend in the Somali economy: the brisk growth of the tertiary sector as a whole, including besides trade, government and services. All these activities within the tertiary sector share the common feature of lower overall productivity, on account of their being markedly labour-intensive, that is their inherent capacity to harbour marginal or incidental labour in their operations. In other words, they employ directly or indirectly, large inputs of manpower for relatively modest outputs.

Moreover, because of their being generally less demanding of enterprise and risk, the sector in its broadest definition tends to attract a great inflow of sinecure and easy-money seekers.

Between 1972 and 1978, according to official GDP estimates, average productive output in the primary and secondary sectors of the economy grew by only 1% annually (industrial and cropping output having actually both declined by 0.5% a year), while the service sector in private and public grew by 6.5%. In addition, the tertiary sector having expanded at a faster rate over the period than either of the two other sectors, finally accounted for nearly 30% of the GDP by 1978. Indeed, if things persist on their current trend, the likelihood is that in the long term, trade, government and services will eventually dominate the Somali economy. And such predominance will obviously be at the expense of the other more productive sectors with their greater potential for value added and real income creation. Already, manufacturing industry accounts for no more than 10% of GDP, and this share of the economy is very likely to decline in relative terms in the future.

In perspective, it is government and trade that account for the bulk of tertiary sector expansion. The problem of big government within the confines of simple economy and with command of a string of auxiliary agencies and offices are known and frequently deplored in developing countries, particularly those which favour a system of state capitalism for political reasons. From experience, such big governments often give rise to lumbering bureaucracies, inefficient services and underemployment or disguised unemployment within the ranks of their personnel. Moreover, these bureaucracies have a tendency toward ever growing expansion and correspondingly declining efficiency over time.

With regard to trade, we have already noted its remarkable

popularity within the Somali masses, nowadays attracting even elderly housewives and very young people. The mania for commercial activities and related services (e.g. real estate speculation) is best illustrated by the following table elaborating the breakdown of domestic credits advanced to each sector of the economy in two consecutive years. As can be seen, the volume of credits allotted to the trade sector averages about 50% of the total loans and advances made by the Somali commercial banking system in 1980 and 1981 (private sector).

Table I. Loans and Advances by Branches of Economic Activity
(in millions of SoSh)

Sector	1980	%	1981	%
Industry	469.1	23.7	566.4	24.7
Agriculture	166.2	8.4	274.5	12.0
Livestock	141.2	7.2	227.5	9.9
Fisheries	28.0	1.4	21.0	0.9
Trade	1047.7	53.0	1098.6	47.8
Others	125.0	6.3	108.0	4.7
Total	1977.2	100.0	2296.0	100.0

Source: Central Bank of Somalia, Annual Report and Statement of Accounts, Mogadishu 1982

It can be argued that the drift toward trade and services and away from other more productive undertakings bodes ill for Somalia's development prospects. For one thing, the relative predominance of the tertiary sector in an economy is now a well-noted phenomenon in post-industrial societies

since it requires a vast productive base to support this labour intensive but relatively low value added sector. Its unnatural projection on a developing economy is therefore a sure sign of the presence of a fundamental dysfunction in its operations. Secondly, for that very reason, the phenomenon could reveal the preponderance in the economy of speculative and other parasitical activities over and above the physical production of capital and consumer goods. And this, in turn, deepens further the country's dependence on the outside world in the form of escalating imports (vis-a-vis exports) on the one hand, and the need for ever more external aid to cover chronic balance of payments disequilibrium on the other.

The Catalytic Role of Public Finance and Foreign Aid

Institutionally, public finance and foreign aid together comprise the twin pillars upon which the Somali economy stands, serving it as the primary engines of growth. At the same time, they also constitute, paradoxically, two complementary tiers which sustain the structure of dependency in the same economy and tend therefore to perpetuate it in the culture.

In the first tier lies the public finance apparatus. We have already seen how the state sector supports the numerous claims of the public on its generous economic handouts and services, be they in the form of nominal employment opportunities or in the form of derived privilege and graft. Indeed, the public sector has evolved into not only a welfare pool at the disposal of a sophisticated few who show a predilection for corruption, but also into a relief center where countless peripheral claimants receive by default many social benefits and economic breaks of various kinds.

Thus, the spirit of dependency which had been carried over from its nomadic setting has thrown its full shadow on the state sector, as the wealthiest supra-national organization in the country - finally reducing it into a clearing house for these competing economic demands, many of which are divorced from the purposes of development.

But yet another economic tier is represented by the agency of foreign aid which has been flowing into the country in generous amounts and on soft term conditions since independence. For a long time, foreign aid discharged the utilitarian function of boosting government income by supplementing its deficit-ridden budget.¹⁰ And such boost was always needed and welcomed by the government, not only to finance its mandatory development programmes, but also to carry out painlessly its inbuilt welfare functions. For the persistent drain on government finance occasioned by heavy public demand for growing relief operations and social services could not be sustained indefinitely without generous injections of external financial assistance.

Thus, foreign aid was transmuted over time into an indispensable arm of domestic public finance itself. Today, the country takes foreign aid so much for granted, and solicits it so actively that it cannot possibly envisage a condition under which it has to forego it one day, since it presently underwrites much of government business and ensures its continued operation at a normal level. Being classed at the near bottom of the least developed countries in the world, it is doubtful that Somalia can function properly without the instrumentality of foreign aid, which today operates much like an economic oxygen tent shielding it from the fallouts of possible bankruptcy. And so the cherished goal of eventual economic independence becomes as ephemeral as ever.

Apparently, the resources of public finance and foreign aid,

far from contributing effectively to development efforts, become wide open to the pressing humanitarian demands of the population. This, together with the havoc played by corruption and misappropriation of public funds, constitutes serious leakages in the financial resources periodically earmarked for capital formation and development. Here again, we have a situation where instant consumption pre-empted almost at source the opportunities for investment at the macro level, with its precondition for domestic austerity for the sake of economic growth. Further, this problem should be seen against the background of declining domestic production and worsening foreign trade position, where the country's export earnings continue to slide down relative to the value of imports, which are more than twice as large as the former.

Toward a Development Paradigm and Innovative Institutions

In view of the foregoing observations, it would appear reasonable and necessary that institutional steps be taken to effect change from the grass roots with regard to the socio-economic dysfunctions sketched here - steps that go beyond mere advocacy based on wishful thinking, as is so often the case.

In the first instance, institutional methods should be devised with the objective of forging a firm link between work and income generation, by putting emphasis on the dignity of labour as a rewarding social obligation. In Somalia, poor as it is, a growing leisure class has come into being which thrives on usurpation of one kind or another, and which contributes little to national income. However, this cannot continue unchecked without ultimately wrecking the domestic economy, which is already often de-

risively referred to as a 'basket case'.

A corollary to the linkage between work and income capacity is that the concepts of incremental development and growth (implying hard work) as the road to collective survival and prosperity should also be popularized. Currently, this perception seems to be conspicuously lacking among the mass of people. For more attention seems to be given to preemptive consumption than providing for the future - reflecting perhaps a fanciful flight from the spectre of poverty in a thoughtless manner. Apparently, it is not well appreciated that economic growth (which is assumed to be a desirable goal) calls for thrift and accumulation of capital and consequently for moderate current consumption. Elsewhere, this is universally accepted as a true and tested common sense, which should repress the sole pursuit of consumption and its creature comforts as an end in themselves.

It is here that innovative institutions can play a pivotal role in fostering a positive attitude toward labor and production, which underlie all material progress, especially in conditions of modest resource endowments as in Somalia. However, institution-building is not an easy task, particularly under Somalia's challenging circumstances, where modern institutional infrastructure is notably weak.^{II} In any case, the initiation of reform-oriented institutions of this nature need to be engineered by competent and pioneering master-builders who are themselves fully imbued with its ideals, and who are also capable of placing themselves above petty interests (which require an uncommon degree of statesmanship). Above all, such institutions presuppose the existence of well-integrated legal superstructure which must be upheld at any cost, that is not subject to exception, negotiation and bargaining in an effort to weaken its impact. In this way, this steadfast legal framework could act as an antidote against the epi-

demics of corruption and speculation which tend to paralyze all institutional initiative.

On the other hand, education and culture which are essential ingredients in all efforts at reform and development are at present in relatively short supply in Somalia, and for reasons that go beyond simple school enrolment figures. However, conditions hospitable for their healthy growth can be created. It is obvious that an effective educated class is needed to manage progressive change, and reverse the current trend of growing expatriate staff performing elementary tasks, in the wake of the mass exodus of local skilled manpower. And nowhere is enlightened knowledge more important than in those holding key positions which affect Somalia's future.

All this brings us to one important concluding remark; and that is that institution-building presupposes the adoption of a new philosophy and paradigm in concert with the practical requirements of the times. For Somalia has, since World War II, witnessed a historic transition from a simple community of scattered nomadic households held together by the ethos of cultural nationalism to a nation-state based on modern political and societal concepts. By its very nature, this transition had required the adoption of new approaches and radical departure from the traditional ways of doing things. In other words, a fresh perspective was called for that drew inspiration from the dynamics of aggregative nation-building and far removed from the segmentations and sectionalisms of the past. And this was contingent on nothing short of the empirical development of new home-made ideology to conduct progressive change. Unfortunately, so far Somalia has not come upon that paradigmatic formula. And until it stumbles upon it, through the efforts of its leaders and intellectuals, its problems will remain intractable.

FOOTNOTES

- ¹ Ibn Khaldoun, the north African Arab sociologist, is said to have considered nomadism as "anti-thesis of civilization", and that it is also "essentially anarchistic". See Mohamoud Abdi Ali: Social and Administrative Constraints to Development, in: Somali Development Administration, vol. I, no. I
- ² For a detailed description of the division of labour typical in a Somali nomadic setting, see I. M. Lewis: A Pastoral Democracy (London 1961), in particular chapter 3, p. 56-89.
- Another author, Abdi Arte, writes: "Male chauvenism in Somali nomads is intricately woven into custom and tradition. Since the Somalis are patrilineal the nomadic life style is suited to man's conveniences. The woman makes the mobile guri (hut), mounts and dismounts it, carries water and firewood, cooks food, churns milk and makes ghee. The man sits under the shade and makes decisions on where to graze, where to settle, if and when to move from one camp to another." See his: Socio-economic Background of the Somali nomad, in: Basic Education for Nomads (Report of a seminar held in Mogadishu 1 - 9 April, 1978 by UNESCO and UNICEF; published by UNICEF in Nairobi), p. 16
- Further on the same author notes that "To the nomad poetry is the most important art and much time is spent composing new poems and reciting age-old ones that have been passed on."
- ³ In my: Parochial Cultural Traits and the Work Ethic in Somalia, in: Maamule, SIDAM Journal of Administration, no. 2, 1981, I have attempted to study this issue within the context of Somali Public Administration.

- ⁴ Gerald Hanley puts it in this interesting way: "...Nomads who had been forced into being parasites of the camel for centuries ...", in: Warriors and Strangers (London 1971), p. 5.
- In another vein, the impression of Douglas Collin was that "the Somali is inclined to be lazy for his dignity does not allow him to do manual work. He usually employs himself in watching his flocks, and he will lie for hours under a shady thorn acacia tree ...", in: A Tear for Somalia (London), p. 15 - 16.
- ⁵ A recent study of Somalia's rural population found that, on the basis of a calorie supply of 2200 per head, poverty conditions to be tolerable. "However, non-food items have been excluded in the calculation of the poverty line." See Vali Jamal: Nomads and Farmers: Income and Poverty in Rural Somalia, in: Dharam Ghai / Sami Radwan (eds.), Agrarian Policies and Rural Poverty in Africa (Geneva 1983), p. 296
- ⁶ "According to an internationally accepted 'Productivity Indices' scale, many Somali state enterprises are currently operating at 25 - 30% in manpower utilization, whereas 70 - 75% is the accepted standard in the developed world." From a statement by Ibrahim M. Abyan (Dean of SIDAM) presented to the Seminar on Industrial Development and Management held in Mogadishu, 4 - 6 October 1982.
- ⁷ This aspect of the nomad's personality has attracted the attention of many observers. See, for example, I. M. Lewis: A Pastoral Democracy (London 1961), p. 1 and 30.
- ⁸ 'Graft' includes not only outright plunder of public money, but also bribery, kickbacks, illegal commissions, etc., all arising from poor government accounting and accountability. In February 1983 the khat drug was officially

banned. And it is generally acknowledged that the consumption of khat, an expensive habit, was a chief predisposing cause of corruption in the public sector.

- ⁹ "Generally, the prices fixed by the Ministry are not fully upheld by the wholesalers and retailers. The reason is the existing gap between supply and demand for the consumer goods." A statement by the Ministry of Commerce to the Seminar on Industrial Development and Management held in Mogadishu, 4 - 6 October 1982.
- ¹⁰ 1971 is considered a watershed year with regard to Somali fiscal autonomy, when a budget surplus was recorded for the first time as a result of a number of institutional measures including nationalizations, confiscation of private assets, wage reductions and freeze in the public sector, etc. Since 1979, however, a relapse into budgetary deficit was evident.
- ¹¹ For a broader view of this issue, see my: Institution-building in Somalia, in: Maamule Special Issue, 1982.

Omar Osman Rabeh

THE SOMALI NOMAD

Introduction

The development of modern science shows us, notably with data processing, that the knowledge of nature and social phenomena tends towards a mathematical formula meaning to say the increasing rigour and objectivity presiding over the scientific approach in view of grasping reality as a whole and the life of the elements composing it. The application of this method to human sciences, sociology for example, places us in contact with notions of individual, group force, opposition and conflict whose general resultant proves to be closely linked to the internal and external conditions operating at the base and determining the situation, orientation and evolution of a given society.

Present day Somalian society is basically nomad, both through its origin and through its composition to 80%. Its internal situation and its problems faced with the demands of the contemporary world are explained to a great extent by this major characteristic that intellectual understanding must take into consideration. We should like to submit to your reflection certain observations relating to the psychological portrait of the nomad so as to attempt to elucidate certain attitudes, certain behaviours which are also, generally, those of the Somalian community. This is also an initial outline that we hope to enrich by future studies. Our paper will consist of three sections:

- the psychology of the nomad;
- his concept of space and time;
- the changes produced by the revolution of October 1969.

The Psychology of the Nomad

The psychology of the nomad^I is characterized by:

- tendency towards a critical mind, more negative than constructive;
- tendency towards temerity;
- an exaggerated sense of pride and liberty with a little megalomania and anarchy;
- impatience and impulsiveness in action and consequently:
- no sense of discipline and a sort of allergy to constraint;
- no modesty; expressions, even justified, such as "you cannot", "you do not know" are often felt as an attempt to lower, to humiliate. They run up against the high idea that the Somalis have of themselves and triggers off a reflex of defence, opposition.

Features which can to a certain extent be considered as qualities, such as courage, soberness, endurance, etc. due to a great extent to the hard necessities of nomad life, somewhat reinforce this "latent resistance", his critical mind and fierce independence.

The question then arises: if these psychological characteristics, it must be said asocial, are really the salient features of the Somali nomads mentality, how do they however succeed in forming a vital community to preserve the existence and dignity of each one? On what basis is this community founded to create solid ties amongst its members enabling them to maintain the life and perennity of the group despite this centrifugal tendency of its component elements?

To put forward that rationality remains a constant, fundamental factor in the Somali mentality may appear contradictory. Nevertheless, this is so: whatever his sense of honour and pride, the Somali is willing to bow before "reason" as long as he proved wrong (Gar-Daro); he accepts the judgement rendered on this basis by the council of 'ancients'. This fidelity, this free submission of each one to reason governs

the relations between the members of the group and, generally speaking, relations between the different tribes. From this point of view there are no prerogatives nor privileges within them, but equality and strict justice between men. Consequently all disputes are solved within the context of procedure and law (the Gar_iyo_Xeer) universally recognized by the Somali nomad society: judicial approaches and verdicts are in fact the same for the same cases.

The pacific and dispassionate, contradictory and public, democratic and educative character of the court proceedings should be stressed. The judgement takes place after the following conditions have been fulfilled:

- the adverse parties together with the witnesses called by them or convened by the assembly has been heard;
- the adverse parties and the assembly have approved the summary of the discussions by the rapporteur;
- lastly, the adverse parties have agreed to the composition of the jury who will deliberate apart.

The sentence is characterized, in the eyes of all, by its conformity to reason and truth. It is rendered in this way, accepted and assumed by the disputing parties as such. Any one who rejects it whereas it satisfies these conditions cannot incur a more severe moral condemnation; practically an excommunication. The proverb in fact states that "whoever denies the Gar denies God". Nevertheless, if the losing party considers himself wronged a flaw in the substance or the form, he may appeal, up to twelve times and if necessary bring his case before judges of other tribes. However, it is rare to arrive at this extremity: the trust in the sincerity and wisdom of the 'ancients' ("God, they are accustomed to say at the start of the case, will not pardon partially, but does not punish us for our ignorance!"), the fear of attracting general disapproval, the influence of the tribe which is both responsible, protector and guide of the parties

generally suffice for the term of the judgement to be accepted. As an illustration we should like to give here an example of a verdict and an anecdote.

In his book 'Xeerkii Soomaalidii Hore' (Somali law in former days) Axmad Sheekh Cali Axmad (Buraale) (1977:II) mentions the following case which occurred only some 60 years ago: a young woman always fled from the family home. Her father brought her back for the third time and warned his son-in-law that this was the last. The unfortunate husband could find no other solution than to tie up his untamable wife and suspend her to the roof! Incorrigible, she told him that he would finally detach her and then she would escape. Furious he drew his knife, cut her shins and ironically invited her to leave "Go now!". Obviously she fell down trying to stand up. This was a serious and bloody affair, and the jury met immediately, as was the custom in such cases. It rendered the following admirable sentence:

- the tribe to which the victim belonged would not ask for material or moral reparation of the infirmity inflicted on her;
- the husband could no longer divorce her;
- no more could he take a second wife with her;
- he would have to buy her a mount, given that she was deprived of the use of her limbs;
- he would have to give her special attention and care owing to the inferiority he had caused.

The jury sought first of all to restore as far as possible the dignity of the woman and assure her future; then to preserve the unity of the home. She gave birth to twelve children ...

The anecdote: The father, informed that his son had lost the case inquired:

"Lost, agreed; but did he accept the cogency?"

"Yes."

"Then I recognize my son in him," he concluded with satisfaction.

Otherwise stated the son was in error; by accepting his error, he had recovered his reason, hence become better, whence the contentment of the father.

Reason demands truth which leads to justice; which in turn requires equality between men and democracy as a suitable atmosphere where all the members participate in producing the decision. Because, precisely, according in producing the "judicial decision is the result and synthesis of individual, partial and multiple contributions from all men" (mala rag wa mudacyo afkood).

Per contra, injustice is felt as a caprice, as an irrational movement, an encroachment on the dignity and freedom of others.

The reparatory and not the repressive nature of court action should be observed, together with its role as reconciler tending to re-establish the fraternity temporarily broken. In fact, the culprit normally asks his victim for pardon, which is generally granted. The judgement, which never orders the death sentence, imprisonment or corporal punishment² on the contrary finishes with a prayer to obtain unity and understanding of hearts, peace and prosperity, paradise, etc. Lastly, the divine light in order that men take the right way ...

The general consensus as to the Gar and to the Xeer places a regulating control over excessive individual initiatives and also limits the range of their social consequence. It creates a social environment around man where he evolves with the same ease as in nature or pastures his animals. Finally, in this nomad society where there is neither exploitation or individual property (all belonging to the family or to the tribe, the enlarged family) and where everything is in common, both in peace and in war, infringements to the customs and law prove relatively few in number owing to the simplicity

of this way of life and the small size of the group. Finally, it must be recalled that this nomad community has always led an independent existence; that it lived outside colonization and that after the advent of independence it preserved the same distance from the central authority until the literacy campaign initiated in 1974 by the revolution of 21st October 1969 and the reinstallation of the nomads in rural or maritime areas subsequent to the long drought of 1973 - 1975.

These two circumstances integrated nomad society, until then confined in an ancestral existence, into the life of the nation, and at the same time, rediscovered its misery and grandeur.

Today, citydwellers correspond to under 30% of the global population. If we consider that this 'citydweller' himself is still a semi-nomad who, most often, was born and grown up in the countryside before emigrating to the town, it can be of interest to question the way in which this nomad-become-city-dweller has reacted to the unaccustomed and complex mesh of administrative, juridical and political structures, firstly introduced by the colonizer, then adopted and developed by the national authorities? To the supra-individual, abstract and general, all powerful authority of the state? Fundamental research, indispensable and complementary to the government's effort to produce social-economic transformation, remains to be done. This study will not fail to indicate suggestions, if not recommendations which would require suitable translation at political, school and institutional level; this integration taking into account the rationality and democratic spirit, encouraging, by better understanding, an improvement to the behaviour of the Somali versus the authorities and its necessities. We observe today "bewilderment" and dis-orientation of the "nomad citizen" and also difficulty in the government getting the message over. This research would

aid in defining the screens and defining the means of suppressing or at least attenuating them so as to facilitate evolution and progress.

His Concept of Space and Time

We should now like to analyze an apparently harmless notion quite unrelated to what we have just stated but which in truth remains closely tied firstly to the culture of this nomad society and secondly to the problems arising from development: i.e. the concept of time and space with the nomad and its implications.

The nomad lives on his herds. These are born, grow up and reproduce all alone. The task of the shepherd is basically limited to watching over them and occasionally giving them some supplementary care. In return, they provide him with milk, meat, skin, transport and sometimes act as currency to purchase certain articles in town such as clothing, sugar, etc.

In short, the nomad gathers the fruits of nature, but does not produce. This is why he has no notion of productivity, which explains the absence of perseverance and patience that we have noted above and hence to a certain extent, this feeling of freedom and touchy pride, not as yet really sobered down. Because productivity assumes not only methodic and continuous action on matter, but also the intelligence of free submission to the necessary constraints of effort.³ Now the space - time reference of the nomad are revealing in this respect: for example, the day is marked by the sunrise, moment at which the herds are freed from the pen; by the midday rest, the men and beasts rest when the sun is at the zenith and the heat strongest; lastly, by the sunset, moment when everybody returns to the camp to pass the night; and the same everyday. The same applies to the seasons which follow each other and

are repeated from one year to another. In fact, it is a question of a perpetual present time, a time closed onto itself, a circular time without perspective and no longer linear. As for space, it can be said that it has two dimensions, horizontal and flat; it is a depthless space, a graphic space, invented (if one may say so) by the herd followed by the shepherd as and where the pastures are found. Its measurement is as imprecise as that of time; it is a space both circumscribed by the naturally limited movement of the animals and nevertheless indefinite because without any cohesion in its deployment; whence a very broad and hazy notion in which the structure and presence of matter is missing.

This results in important consequences in the historical and cultural, economic, scientific and technological, social-political fields.

Historical and cultural

The nomad way of life creates a special tendency to dream owing precisely to the calm, silence and solitude of the shepherd in nature, amongst his animals; this is why the Somali very specially favours the proverb, poetry and song which produce a profound impact on minds. But these are, by definition, cultural forms outside the flow of time, in the intemporal and which draw their charm and power from this fact of outside duration. The national life, the popular spirit is basically maintained and developed through this oral expression where memory plays a primordial part, even though failing. It is in fact significant that the Somali nomad does not relate the events which mark out the course of his existence (birth, marriage, drought, war, etc.) to a fixed temporal reference, to situate them in time as it is done for example in the Western World where historical dating commences from the birth of Christ. A mother, for example,

will most often say that her son is 'one year old', 'two years old', etc., rather than say 'he is born in'. The awareness of the succession of facts and their internal liaison confers on history its determinating importance for the national life. It generates the determination of men to act in turn on the course of history and to modify it in the direction of their design. However, the nomad leads an existence whose rhythms are merged with the cosmic cycles. His concept of the world, owing to his innocence, leaves out this decisive significance of history, the progress that it marks from one stage to another, the prospect that it can open as to the future and as to freedom. It is thus impossible to analyze objectively the present day historical situation, still less go back to its causes, if it is true as Hegel stated, that "what has happened is nothing without knowing how"; that is to say, without the intelligence of his dialectic and historical genesis, in the successive developments through which it has gone and progressively reached its present state.

This attitude of mind is a serious obstacle to the understanding of history, and firstly of the history of the nation. It is true that the Somali's interest has been scarcely stimulated in this respect by the rarity of documents, practically inexistent in the national territory, or inaccessible owing to their remoteness (in the former colonial capitals) or the foreign language in which they are drafted, for men who, until recently, were practically illiterate, except for a very small minority who benefited from the possibilities of modern education and who, despite all, remain themselves profoundly impregnated by this traditional culture.

Economic

As we have said, the nomad obtains his subsistence from his animals. We have seen that, precisely for this reason, he

has no notion of productivity. Human activity which tends towards the production of goods is based on the minimum working time necessary (but variable according to circumstances) to produce a given value; this reciprocally reveals the valuable nature of time ("time, it is said, is money") whereas space appears as the place of creation. Productive activity covers matter placed so to speak in the heart of space and time, its two ways of existence. It is the direct contact, through work, with matter which reveals the veritable dimension of the space - time factor.

However, the nomad lives to a certain extent outside this matter. He maintains only a mediate relation with it, through his animals. He ignores both this wildcat work, i.e. the natural process, purposeless and unmeasurable, and conscious human work, by which man attempts to insert his action into this vast process to attempt to change the course and quality: his herd looks after both and offers him the fruits of the synthesis which can thus explain his little eagerness for work and his generosity as to time and space.

Scientific and technological

However work on matter, apart from time and space, refers to the dual intellectual and technical instrument indispensable to transform it: theoretical understanding and practical manipulation alone give control over it. "Nature is only controlled by obeying it", said Bacon. In other words, matter requires from men that he carries a message (knowledge) and an 'arm' (tool) in order to fulfill his desire, submit itself to his will. Now science (where intelligence decomposes, calculates, spatializes as Bergson would say) is defined precisely as the measurement (and mastery) of this matter and its movement; whereas the technological infrastructure, increasingly complex, appears to tend towards the restoration of a second natural matrix (within the meaning of Aristotle

stating that habit is a "second nature") aiming at compensating for the first in view of reproduction of phenomena as required. Man thus seeks to superpose on the universe, dominated by admirable but blind laws, a world of rational harmony of his own creation and which should progressively assimilate in itself this nature left on its own, as with Freud the ego tends to assimilate the id.

Work-matter-time and space-science and technology are closely tied; their fecundity lies in the unity and continuity of the whole. The nomad appears to be the man who has not yet grasped the first link in this chain. Moreover, other factors are involved to worsen this situation: insufficient food which makes all physical effort exhausting; the religious fatalism which devalorizes the effect of human action; the khat which lowers determination, etc.

Social-political

The social organization is the permanent search for an order which, in its rationality, continues and reflects the natural order and also satisfies a human ethical requirement. This regulation, in accordance with the laws of nature and moral logic, of relations between men and with the environment requires in practice a correspondence between the social-economic structure, the juridical architecture and the administrative organization of the community. How then, in view of the mentality we have tried to roughly outline, does the Somali see their complementarity, their interdependence and their reciprocal determination? What idea does he have of his contribution, as a citizen, to the institution and improvement of this rational order in the general interest?

The Revolution's Contributions

The revolution of 21st October 1969 introduced important

changes in this respect:

Firstly, something quite new, the reference to science ("scientific socialism": Hantiwadaga Cilmiga ku Dhisan) and to the history of humanity (Taariikhda Beniiadamku soo maray).

Secondly, there is the notion of productivity (Wax soo Saarka), the revalorization of intellectual and manual work (Maskaxdeena iyo Murugeena an Maalo), its practical and collective application (Iska Wax U Qabso: help yourself and God will help you) and the primacy given to the human element.

Third, the adoption of the national language as official language with the fortunate consequences that this has produced:

- a change from oral tradition to writing;
- the practically total elimination of illiteracy;
- the enrichment of the culture and better knowledge of the national history (oral literature, history written, edification of monuments to the glory of heroes, etc.).

Four, the development of the productive apparatus, practically inexistent.

Five, the reconversion of a considerable part of the nomad community, victim of the drought, into farmers and fishermen with the triple aim of saving human lives, enabling the victims to ensure their existence and lastly to contribute thus to the development of the national economy.

Six, the rehabilitation of the status and social role of the women.

Conclusions

The revolution has attempted to promote in-depth transformations, it has wished to restructure the way of thought and the economic and social organization of the Somali community. These changes have not yet been the subject of any serious

and complete theoretical reflection which would define the historical importance of this experiment, the insufficiencies latent in their internal cohesion together with its limits relative to the level of the development of the society.

FOOTNOTES

- ¹ This description would appear to concern initially the 'town nomads' (superficial modernism and profound traditionalism) but relates naturally to bush nomad, "his contemporary ancestor".
- ² It is true that nomad way of life neither requires nor allows for the institution of the structures required.
- ³ The celebrated dialectic of the Master and Slave with Hegel will be recalled: the slave is freed from his social condition by a new mastery: that of matter, by work, at the same time as the master ruins himself in idleness where time and space, no longer useful, vanish for him ...

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THE ONGOING PROCESS OF GRADUAL DISINTEGRATION OF
THE TRADITIONAL SOCIAL AND ECONOMIC SYSTEM OF
PASTORALISM IN SOMALIA

Introduction

In the SDR, a country with a minimum industrial development as well as a weak agricultural economy, the majority of the population depends for their living directly or indirectly on the pastoral sector. In addition to that this sector meets a good portion of the internal demand of animal products and represents the main source of the export earnings of this country. Consequently, its development is of paramount importance for the economic and general social development of Somalia. The pastoral economy is at present undergoing a process of crisis and deep rooted changes. Considering its role on the economy and in the entire social development of the country it is a necessity of serious immediacy to study the causes, effects and trends of these processes.

The gradual disintegration of the traditional economic and social system of pastoralism in Somalia is one such processes cited above. It manifests itself not in the form of a drastic transformation of the whole system, but in a gradual and differentiated manner. The main objective and underlying causes of this process are:

- I. The progressive development of the productive force, whose intensity is mainly felt in the last three decades. This development mainly realised through the national development programmes is clearly noticeable in the form of improved water resources, improved veterinary service, introduction of modern forms of transport (automobiles),

especially for the continuous exchange of goods between urban and rural areas with its connected infrastructure, etc.

The general development of the productive forces in the cities and in the whole region in general also contributed to that of the pastoral economy. Through the development of small industries, the transport system, the trade etc. in Somalia, and through the rash economic development of the neighbouring Arabian countries (due to the exploration of oil), the pastoralists are provided with market and employment possibilities.

This development exerted a cumulative effect of change on the traditional system of pastoralism in Somalia, which evolved historically to secure the existence of the pastoralists in a situation whereby the productive forces were of a very low stage of development.

2. Connected with the development of the productive forces is the expanded development of the money-commodity relations in the pastoral economy which represent the most important force behind the process of disintegration. The ever increasing demand for animal products due to the expansion of the internal market and the constant national need to increase hard currency earnings from livestock export led to the increased commoditization of the products from the pastoral sector. Out of it resulted an economic stimulus which could no longer be satisfied by such an economy which is mainly of subsistence nature. The economic drive to increase production in order to satisfy the market stands in contradiction with the unchanged dependence on the limited natural resources, resulting the overloading of these resources which represent the basis of this economy. In such a situation the traditional economic and social system of pastoralism exists no longer in its pure form, it carries the seed of change and disintegration within itself.

The development of money-commodity relations among the pastoralists varies in different parts of the country. The greatest dependence on the market is shown by those pastoralists in the area of the Benadir coast, the hinterland of the Red Sea, around big towns and along the highways and roads. Accordingly the process of disintegration and the squeezing of the traditional system is very pronounced in these areas.

3. There are a variety of non-economic factors that together with the economic ones form a complete system of influences on pastoralism that lead to the gradual disintegration of its traditional relations and structures. These include the colonial domination, the national liberation movements and the establishment of a national state.

Forms

The process of gradual disintegration of the traditional economic and social system of pastoralism in Somalia manifests itself in a variety of forms.

Gradual disintegration of the traditional social and economic ties of the family and the group is one of the major forms that this process is expressed. In the historical development of pastoralism, there is a whole system of relations, structures and institutions developed whereby simple cooperation is established among the lower structural units of its social organization (family level) and military and political cooperation takes place among the larger units (group level). Such a cooperation corresponded with the existing low development of productive forces and hence the necessity of collective security to safeguard their existence. As König (1981:28) clearly expressed the family was as a social unit a weak organism in order to survive alone in such harsh conditions. Out of this necessity there must be developed forms of groupings and cooperation

that granted the security of the property from within and from outside. It became also possible to conduct collective raids against the other groups in order to enlarge their own stocks and to conquer grazing grounds and water places.

Pastoralism in Somalia shows no digression from this general trend of development. To mention some of the traditional forms of cooperation among the family and the group: they include collective security against other groups (diya-payment is of pivotal significance here), collective herding of livestock (camel herding being the most important), reciprocal cooperation in the day to day activities (building hamlets, erecting animal sheds, watering the stocks, digging wells, etc.), the material support in case of disaster and emergencies.

The process of gradual disintegration happening to the traditional system of family and group economic, social ties is reflected by the weakening of the diya-payment as an institution. The diya-payment is no longer economically justifiable due to the fact that livestock acquired a commercial value and particularly the camel becomes a dear commodity. The owners have possibility to cash it instead of paying it for a crime not personally committed. The economic self-interest of the individual overshadows the obligation towards the traditional institutions. Consequently it often comes to quarrels and arm-twisting among the members of the group when they have to pay diyas. It often becomes the responsibility of the state power to enforce it through court decisions.

The practice of diya-payment which developed in accordance with the principle of collective responsibility of the group for murder and blood revenge stand always in contradiction with the legal codes of the modern state system which holds the individual responsible for his deeds. The murderer, as happens from time to time, is taken to prison, unless as often the case is, the group elders work out a compromised

position with the authorities in order to safeguard their kin from individual punishment and secure his release. It happens sometimes that the damaged group refuses to accept the diya-payment and insists that the authorities should proceed with the punishment of the murderer in which case he may be sentenced to death or long imprisonment. In consequence of these difficulties and contradictions the institution of diya-payment loses gradually its significance.

In a situation where the state takes the responsibilities of safeguarding the security of the population the absolute unity and togetherness of the group should no longer be a necessity of life. The danger of outside raids or the possibility of conducting raids against other groups should no longer be a reality. Consequently the political and military alliances of the greater units should lose its importance. It should be normal that single families bear their own pastoral activities independently, i.e. single family units can exist economically alone.

The wealth of a family or a group used to be measured most often against the strength of their camel herds. And within the diya-paying group the herds of the individual families used to be considered as the collective property of the whole group. So it was possible for a member of the group that himself had no camels in case of a murder or a serious injury of a member of other groups, the possibility to pay off with the herds of the group. On the other hand, every member of the group felt individual responsibility towards the group camel herds, and hence they were reared together. The available workforce used to be utilized collectively, for the grazing, watering, guarding and defending against raids and robbers of camel herds.

With the weakening of the diya-payment institution and the strengthened growth of the money-commodity relations the camel loses its status of being the collective property of the group. The herding of the camels gets transferred to

the individual owners just as the case is with the small stock. As a result the economic necessity of the togetherness of the group as was expressed by camel herding, is gradually disappearing.

Since camel herding requires large labour inputs, and with the benefits of collective work receding, the families with less workforce are no longer in a position to keep on with this production activity. From there one can drive the conclusion that camel rearing would diminish as a pastoral occupation in Somalia.

The slackening of the traditional system of collective work among the Somali pastoral community is also reflected in the watering of the stocks. The watering of the herds and flocks in the dry season usually demand a far larger labour force as could ordinarily be mastered by the individual family units. Shortage of waterplace, is a well-known cause for a bitter struggle in order to have access to the very few wells available. In addition, water should be drawn from deep wells with simple instruments and hence requires a lot of time and able-bodied men. All these difficulties used to be coped with through the traditional organisation of sharing and pooling together of the available workforce.

With the development of the money-commodity relations among the pastoralists, labour itself acquired a commercial value, and hence the principle of communal collective work gets squeezed into the background. The waterplaces are usually situated in the neighborhood of a permanent settlement (tuulo or town) where hired workforce is available. Watering livestock is a good occupation in the dry season for such people, who themselves mainly migrated (mostly temporarily) from the pastoral sector.

The weakening of the principle of reciprocal cooperation among the Somali pastoralists is also expressed in the gradual disappearance of the traditional exchange of meat presents. When a family slaughters an animal, all the

neighbouring relatives were used to be given a certain present of meat. This habit of exchanging meat presents compensated the otherwise prevalent shortage of meat consumption among the pastoralists due to their reluctance to kill their animals at free will, and of course the absence of a meat market where one can get a days consumption without sacrificing a whole head of his stock. The camel was particularly useful in this respect, since it could be divided among a large number of families and with sufficient amounts. At present this traditional obligation is no longer honoured. When a camel is to be slaughtered due to a broken leg, sickness or injury from a wild animal, its owner sells its meat in the nearest tuulo, a town or to the neighbouring pastoralists. This individual economic interest created by the market deprives sometimes the owner himself to consume a well needed product. This trend is also recorded in the other products of the pastoral economy as milk, butter etc.

This trend of gradual disintegration of the traditional social and economic system of pastoralism in Somalia is also noticeable in the ideological aspect. The state - first the colonial state and after independence the national state - took over the responsibility of administration, the legal system, the security etc. from the traditional structures as the clan-families and the diya-paying groups, which naturally weakens the socio-politically base of these structures. Accordingly the importance of the general conference (shir) of the adult male well presented by I. M. Lewis (1955:57) as well as the traditional legal system (her) and in general the concept of collective defence diminishes.

The National Liberation Movement played a good role in planting the seeds of transformation in the ideological value of the pastoralists. It introduced into the pastoral community new ideas and values which did not fit into their original way of thinking and organization. Instead of, at

the time prevailing paying absolute loyalty to the family and the group, the National Liberation Movement spearheaded by SYL, SNL, SDU, etc. introduced national consciousness which transcends the narrow attachment to the traditional structures. These organisations made their objective to overcome the traditional division of the community and fairly succeeded in the period before the independence by minimizing clan feuds and contradiction.

As could be abstracted from the short history since the formation of the national state and the time of the liberation struggle, it is noticeable that clan consciousness with all its influences fluctuates with the strength and character of the given central power. Fluctuations at the ideological level have temporary retarding effects on the process of disintegration of the traditional relations and structures, and even sometimes give new impetus to certain parts of the latter. But basically however, the objective process of disintegration of traditional social and economic system of pastoralism caused by the development of the productive forces, the strengthened development of the money-commodity relations among other factors continues.

Labour migration is another typical form of the process of disintegration. Labour migration from the pastoral economy has both internal and external orientation. Internally within Somalia the pastoralists migrate to the urban areas, to the plantation area where they are employed as seasonal workers, and to the construction sites employed as manual workers.

The main trend of this migration is the externally oriented one. During the colonial times a limited number migrated towards the metropol (Great Britain and Italy) and usually got employed as seamen. Other areas of concentration for the Somali migrant labourers used to be the British military base and the oil refinery in Aden, the port and the French military base in Djibouti, and to a certain extent East and

and Southern Africa. In the last two decades the stream of labour migration turned towards the oil-rich Arabian countries - Saudi Arabia, United Arab Emirates, Kuwait, Qatar - with an unprecedented intensity.

The period of absence of the migrant workers varies. For those migrating within the country in search of work it is mostly shorter. For those migrating to a foreign country the situation is more complicated. The period of absence can - disregarding short visits of for instance every two years - last as long as they can get an employment. It is extremely rare that the migrant labourer works outside the country for a certain period and then settles again permanently to his original life of pastoralism. Such workers oscillate between the pastoral settlement and the work place during their productive life time. There could be breaks which could even last as long as ten years.

The main cause of the labour migration is not the outright separation of the migrants from their means of livelihood - livestock, grazing lands and waterplace - i.e. their disappropriation, but rather the main cause is the change happening to the traditional social and economic relations and especially the penetration of the money-commodity relation in the pastoral economy. The growth of the market relations exposed the pastoral economy to an intensive exploitation through commercial capital whereby its surplus products and sometimes part of the necessary product is appropriated outside it. Consequently, the ability of the pastoral economy to reproduce itself is weakened and in turn its vulnerability towards the natural calamities gets increased thereby rendering the life of the pastoralists more precarious. Hence the labour migration reached its peak at the height of the 1974/1975 drought. In the northern provinces of the Republic the migration took the form of a mass exodus of the male population. Then there is rarely any family without any member abroad.

Most of the migrant labourers are compelled to migrate through the bitter realisation of no longer being able to secure the lives of their families from their flocks and herds alone. There exists also other secondary reasons for a pastoralist to migrate. These include: an economic drive to enlarge his stock or to acquire a more secure and well-placed waterplace, like a berked; a need to establish his own family (especially young men); the psychological pressure exerted by those already migrated - they are often better off, have money, bring home industrial goods like radio, watches, clothes etc., and come back with civilized ideas. Labour migration contributes to a large extent to the process of the disintegration of the traditional system and structures of pastoralism in Somalia. From it results the weakening of the power of the family head, removal of workforce from this sector, introduction of new needs and ideas.

In the pastoral community the family head, the father, played the traditional role of being the only recognized owner of the family individuals within the family economic unit. Hence the dividing of this property among the members was his sole right. The fact that some members of the family find employment outside the domain of the family head and could earn their own living independently weakens the power of the father over the family members. The traditional dependency of the young men on the family head to establish their own families and instruments of production is very much reduced by this economic source.

The fact that the migrant labour force is almost exclusively composed of men highlights the growing shortage of labour in the pastoral sector, contrary to the generally held belief of surplus labour availability in it. This situation is particularly obvious in the field of great stock rearing which traditionally depended on male labour. Consequently many pastoral families are compelled to give up camel

rearing and switch to small stock or totally give up the pastoral way of life and migrate to urban areas. The introduction of new consumption habits and new ways of thinking into the pastoral community is a further source of new impetus into the process of disintegration. The labour migration facilitates the acquiring of these needs and habits - smoking, khat chewing, new foods, clothes, radio, etc. - which could barely be satisfied in this sector, and hence speeds up the development of money-commodity relations whose disintegrating effect was explained earlier. Relevant in this context is also that a migrant labourer, who lived a certain period in a foreign country or in the towns, acquires a wider horizon of thinking than those who never left the pastoral society. Since the migrant labourer from the pastoral community works with labourers from all over the world - particularly in Arabia - it is a sufficient cause for him to acquire a wider conception of life and the world around him which in turn weakens his dogmatic attachment to the traditional systems.

The tendency of increased sedentarization and with it spread of tuulooyin (settled villages) is one more example of the ways in which the process of disintegration manifests itself. This process of splitting away from the pastoral economy takes two major forms - crossing over to agriculture or migrating towards the urban areas. At present the latter option is predominant. Towards urbanisation is mainly facilitated by the total bias of the development orientation of the national state since independence to urbanisation and hence continuous migration from rural areas, both agriculture and pastoralism.

The educational system is a sufficient example to verify this tendency. It is totally geared towards a city life. For a child from a pastoral family to go to school means automatically to quit life in this sector. Secular schools

are found only in the towns and tuulooyin, whereby the child is immediately introduced into another life style. There are no possibilities for the school leavers to get a paid employment in the pastoral sector, and hence they end up in the towns.

Worse still the school curriculum plays no role in preparing the child for the possibility to go back to the pastoral sector.

The main aspect that the process of sedentarization of the pastoralists manifests itself is the spread of tuulo-formation, which is mainly a result of the intensified development of the money-commodity relations among the pastoralists for the last three decades.

The tuulooyin can generally be classified into two main groups - permanent and temporary ones - the former being of paramount significance for the ongoing process of disintegration. These structures are very varied in their sizes. The smaller ones are composed of few huts of mud or wood, whereas the bigger ones are composed of dozens of such huts or stone houses, which are used as shops, teahouses, living quarters, blacksmiths, tailor shops, etc. Hundreds of huts (agal or mundul or both) are also normally formed around the vicinity of the tuulooyin.

The formation of tuulooyin increased substantially with the growing use of trucks as a means of transport facilitating the transport of merchandise from the towns. The establishment of more reliable water sources in the pastoral areas (waro, berkeds, deep boreholes, etc.) also act as a precondition for their development.

The tuulooyin in this particular context form a sort of a transitional socio-economic stage between pastoralism and urbanism, considering the life style and the economic activities going on there.

Further from the process of disintegration is the separation

of handicraft activities from pastoralism. The handicraft activities include productions of such essential tools and items prepared from metal, leather and wood. They were mainly performed by certain groups of people - midgo, tumalo, etc. - who are looked down by the ordinary stock herders. The midgo work normally with leather to produce shoes, sandals, bags, etc. while the tumalo as their name indicates produce such tools as axes, spears, knives, etc. It is self-evident that their activities were very essential for the pastoral society and hence that their activities and livestock rearing complemented each other as a single economic entity.

As long as livestock presented the most important source of livelihood, anybody who had no herds should be dependent on those who owned it. As a result of this there developed in the pastoral society relations of dependence whereby the livestock rearer appropriated the work of other groups of different profession in a variety of forms.

The growing tendency of the separation of handicraft activities from pastoralism is gradually coming to maturity. The strengthened development of money-commodity relations and hence growth of such commercial centers as towns and tuulooyin offered a market opportunity for the handicraft products, enabling the producers to earn their living by selling them. Hence they are no longer economically dependent on the livestock herders. Consequently the handicraft activities moved towards the permanent settlements, and no longer formed an essential part of the pastoral economy. Furthermore, those groups of people found in the cities and tuulooyin not only the possibility to live by their trade independently, but also they took other employment opportunities, which were not normally acceptable to what Lewis designed as the noble Somalis, for instance as sweepers, hairdressers (though the attitudes towards these

professions differed in different parts of the country).

Other handicraft products which are produced by the ordinary herders as containers for water, milk, ghee, eating utensils, mats, ropes, etc. are experiencing similar processes of separation. They are increasingly available in the market as finished form, in which case their production by the pastoralists is becoming superfluous.

Conclusion

Pastoralism in Somalia is undergoing both - in its economic base and the system of social values that developed within it - a process of deep crisis. In this process the disintegration of the traditional system is a major factor of influence. The fact that what is disintegrating are the basic economic and social tenets and characteristics of pastoralism makes the collapse of the whole system a possibility. This of course will have grave consequences for the overall development of Somalia, where the greatest portion of the territory can only be best utilized at its present development, through pastoralism. In addition to that, so long the majority of the whole population is dependent for its livelihood on the pastoral sector, the economic capacity to absorb all those being released is not at present tangible, not mentioning the need to get viable economic sources to compensate those lost through the disintegration of the pastoral system, which represents the major export earning sector of the national economy. Since the process of disintegration is still in process, and in certain cases at its early stage, its effects and forms of manifestation may not be as clear as is depicted here. This paper is an attempt to lay the ground for further specialized research on the process of change taking place within the pastoral economy. This will help devise a sensible approach to the

problems of the pastoral community.

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Anders Hjort / Mohamed Ali Hussein

CAMELS AND SOMALIA: THE CAMEL RESEARCH PROJECT

About two years ago a research project called the "Somali Camel Research Project" was started at the Somali Academy for Sciences and Arts (SOMAC). SOMAC applied for support from the Swedish Agency for Research Cooperation with Developing Countries (SAREC) under the umbrella of a wider agreement on research cooperation. With such support Somali researchers are implementing a number of research activities. The present paper gives a brief outline of the project. It points at a few crucial factors for camel pastoralism in Somalia and hence it outlines a research problem rather than presents reached conclusions.

The project is multi-disciplinary, mainly with Somali research input. It is anticipated to grow gradually in momentum as competence in the field of camel research grows. The activities up to date have included a study of the camel's browsing behaviour, a camel trypanosomiasis research project, an investigation into breeding and reproductive patterns, research on camel milk production and preservation, an investigation of different types of camels and a study of the role of the camel in folklore. The paper mentions these subprojects and activities planned for the coming two years in the last section, but focuses primarily on their background and context. It is organized in three steps:

- (1) some salient features of the camel in Somali economy;
- (2) factors constraining camel pastoralism;
- (3) the reproduction of camel herds and their food production.

The first section offers a national perspective, while the second and third give a systemic one on pastoral food production, sketching more of a household perspective.

Some salient features of the camel in Somali economy

The interest in the dromedary species is today growing within the scientific community. Detailed information is sparse however, and much, even basic research is needed in order to provide a coherent scientific picture. For Somalia one can note an increasing interest in the role of the camel in academic and administrative quarters. This fact should surprise no one since the country harbours one of the world's largest camel populations.

Livestock forms the backbone of the Somali economy. As much as 80% of its citizens are engaged in one form of animal husbandry or another, and 70% - 90% of the country's export revenues derive from the livestock sector. The main recipient is Saudi Arabia, and Somalia covers more than half of that country's meat import according to official statistics.

The livestock population of Somalia is made up of camels, cattle, sheep and goats. Their distribution by species and region is given in the following table (the 1975 government census):

Region	Humans ('000)	Camels ('000)	Cattle ('000)	Sheep ('000)	Goats ('000)
<u>Northwest</u>	708	926	189	3152	3978
I. Waqooyi Galbeed	440	606	145	2242	3076
2. Togdheer	268	320	44	910	902

Region	Humans ('000)	Camels ('000)	Cattle ('000)	Sheep ('000)	Goats ('000)
<u>Northeast</u>	<u>384</u>	<u>600</u>	<u>101</u>	<u>3132</u>	<u>3370</u>
3. Sanaag	145	205	74	1521	664
4. Bari	154	240	15	1388	2095
5. Nugal	85	155	12	223	611
<u>Central</u>	<u>397</u>	<u>1146</u>	<u>558</u>	<u>1724</u>	<u>4478</u>
6. Mudug	215	751	340	1136	2744
7. Galguduud	182	395	218	588	1734
<u>Shabelle River</u>	<u>1152</u>	<u>991</u>	<u>977</u>	<u>708</u>	<u>2098</u>
8. Hiran	147	461	170	287	1159
9. Middle Shabelle	236	236	366	325	720
10. Lower Shabelle	398	293	419	90	200
11. Benadir	371	1	22	6	19
<u>Juba River</u>	<u>458</u>	<u>1081</u>	<u>1564</u>	<u>581</u>	<u>902</u>
12. Gedo	212	784	528	500	725
13. Middle Juba	246	297	1036	81	177
14. Lower Juba					
<u>Interriverine</u>	<u>402</u>	<u>554</u>	<u>355</u>	<u>134</u>	<u>466</u>
15. Bakool	100	192	100	55	274
16. Bay	302	362	255	79	192
Total	3501	5298	3744	9431	15292

Table I. Rural population and number of livestock in the 1975 census

Figure I. The camel is a major domestic animal in Somalia. The Somali type of camel is large and a good milk and meat producer.



However, stock counts are extremely difficult to carry out (due to seasonal migrations, also across national boundaries, and reluctance by the local population to give herd sizes, just to mention two problematic reasons). The difficulty has been illustrated in the "Livestock and Range Sector Study" (1981:7) by comparing different counts:

Source	Year	Camels ('000)	Cattle ('000)	Sheep & Goats ('000)
Hartley	1966	2000	1756	7000
Walker	1966	1874	1756	5724
Pillai	1968	2500	2500	9000
Hartley	1968	2500	2500	15000
JP 15	1971	--	2767	--
German Planning Advisory Group	1973	3000	3000	15000
IDA	1974	2500	3000	14000
Government census	1975	5298	3744	24723

Table 2. Varying results of stock counts.

(Source: Livestock and Range Sector Study, Ministry of National Planning, 1981)

If we look closer at the data and utilize recent areal surveys, the great variations remain. This fact comes forth in the following table. It was compiled in early 1982 with the help of T. Willby, Ministry of National Planning.

Table 3. A comparison of the 1975 census with Central and Northern aerial surveys.

Central Region (Hiran, Mudug, Galguduud)

	1975 census ('000) (dry season) ¹	1979 aerial survey ('000)	
		(dry) ²	(wet)
Camels	1607	314	963
Cattle	728	233	389
Sheep & Goats	7648	6330	11122

Table 3. (continued)

Northern Region (NW, Sanaag, Togdheer, Nugal, Bari)

	1975 census ('000)	1979 aerial survey ('000)	
	(dry season) ¹	(dry) ²	(wet)
Camels	1526	1027	1529
Cattle	290	203	204
Sheep & Goats	13082	12307	14758

¹ carried out during the Jilaal dry season² carried out during the Hagaa dry season

The figures for Central Region are not directly comparable, since dry season figures refer to the two different seasons, and also because a moderate drought occurred between the counts (1979-1980). The estimated losses during this period are 273,000 camels, and 4,464,000 sheep and goats and 289,000 cattle (T. Willby, personal communication). Nevertheless, the trend is clear; the 1975 census consistently exhibits higher counts on camels and cattle (small stock fluctuate more widely in numbers).

These statistics should be enough to demonstrate a general unreliability of available stock censuses. A reflection of how uncertain stock counts are can be seen in available calculations on meat off-take from the national camel herd. We have seen varying annual rates in different reports ranging as much as between 1% and 5%. With a need to maintain a balanced herd composition and also a requirement to produce beasts for burden, the herdsman (the animal husbandry expert) must, in the long time perspective, refrain from such off-take that threatens long-term stability. If that is not possible under short-term conditions his family

herd will deteriorate. In consequence we assume for the sake of principal discussion that the meat off-take lies near a maximum under given circumstances which he faces. Figures on hides production over recent years (which have maintained a fairly constant level) hint a decrease in the individual annual consumption of meat granted a growth in the number of consumers. True, such rough estimates are dangerous, and we may already on this level note a need for research into one aspect of camel husbandry.

The figure for export and municipal slaughter are given in the following table:

Year	Municipal Slaughter	Exports No.	Value SoSh	% of total Livestock Export Earnings
1970	31,194	25,808	18,967,303	15.9
1971	31,491	23,707	16,597,559	13.5
1972	43,618	21,196	14,731,701	9.2
1973	30,119	27,914	23,334,994	11.9
1974	37,968	23,692	30,249,846	13.6
1975	56,509	33,351	47,421,072	12.4
1976	38,987	36,622	49,394,445	17.6
1977	25,978	34,602	48,211,235	17.2
1978	26,351	20,968	40,525,788	6.9
1979	38,987	12,508	?	-

Table 4. Camel municipal slaughter and export.

(Source: Statistical Abstracts of Statistics Department, State Planning Commission)

One more interesting piece of information from this table is the fact that the export of camels accounts for approxi-

mately one tenth of the total revenues from livestock exports. This means then some 8% of the total Somali export earnings. Government expenditures in the livestock sector seem weak against its dominating role, only some 15% of the budget. The interest in the camel is particularly meagre. This fact provides a strong argument for carrying out more research on the camel, research that can offer reliable advice for future planning and development inputs.

As things stand today, the only planned development effort that will have beneficial and direct impact on the camel population is an improved veterinary service. In planning quarters it is hoped that this will bring down the present mortality rates, averaging around 8%, to about 6.5% during the on-going Five-Year Plan period (1982-1986). If this goal is obtained, the concomitant increased off-take will just balance an increased food demand from a growing population.

A number of development projects, especially in the field of range development, may have effects on the camel husbandry. One may think of fencing or other activities that introduce new restrictions to herd movements, or of systems of stratified access to watering opportunities. It is not obvious that all inputs for range improvements are introduced after considering requirements of camel husbandry, not even to those production systems where camel husbandry forms a part. Some research on the implications of future camel herding for other production activities and ecological circumstances is obviously needed urgently.

Various attempts in Africa to create suitable conditions for joint collective efforts in livestock rearing have occurred and been discussed. One way or the other, it seems to us, some form of cooperative organization is the sole way to create a hope for positive incentives to counter-balance the current rapid process of herd ownership strati-

fication, a privatization which seems almost universal. In Somalia efforts have begun to establish new communal reforms as parts of major integrated development projects: The Bay Project in southern Somalia, Central Rangeland Projects and Northern Rangeland Projects. The cooperatives are intended for livestock traders, for settled pastoralists who want to legitimize rights to a piece of land, and for nomads who become inspired by the initiative and get a wish to acquire a piece of land for dryland farming in an agropastoral system. Judging from experiences in other countries there is a definite risk for town-based pastoralism where affluent town-dwellers invest in livestock wealth through representatives.

The cooperatives established in 1979 are presented in the following table. They are based on the principle that members contribute to a communal herd, usually a flock of sheep containing some 200 - 400 head. Remaining animals and farmland are privately owned. The number of camels is minute.

Table 5. Range Cooperatives at the end of 1979

	Dhumay	Degaar	Shidaale	Carmaale	Dan Weyn
Year establ.	1976	1976	1977	1976	1977
Area (ha)	6540	3000	1200	2420	3000
No. of members	30	52	94	24	61
Camels	30	67	29	--	45
Cattle	26	240	65	35	150
Small stock	3800	5000	3400	600	4500
Total LU	442	820	440	92	654
ha/LU	148	3.7	2.7	25.5	4.6

Table 5. (continued)

	Madare Dhuur	Madare Hoose	Ceel S. Karin Diyood	Balurbaal	Kal Booc
Year establ.	1975	1976	1977	NK	1977
Area (ha)	2900	1350	1000	1750	1780
No. of members	61	65	60	45	42
Camels	--	50	34	24	45
Cattle	74	1900	81	40	60
Small stock	2400	6018	5018	4200	3420
Total LU	315	1902	624	489	456
ha/LU	9.3	1.3	1.6	3.6	3.9

Table 5. (continued)

	Suuf Dhearel	Cudud	Habari Heshay	Ceel Bardaale	Farsooleey
Year establ.	1977	1978	NK	1979	1979
Area (ha)	1840	6300	3460	7000	2000
No. of members	52	34	39	120	40
Camels	--	110	41	30	--
Cattle	140	119	75	2200	5000
Small stock	5050	5250	3370	9790	1000
Total LU	645	776	461	3215	5100
ha/LU	0.9	8.1	7.5	2.2	0.4

Source: Livestock and Range Sector Study, Ministry of National Planning, 1981

Another kind of collective effort is to set aside pastures either for seasonal pasture or for a rotational grazing system. The situation at the end of 1979 was as follows:

Region	Seasonal		Rotational	
	Number	Total area (km ²)	Number	Total area (km ²)
Northwest	4	2000	1	700
Togdheer	7	3655	21	880
Sanaag	4	2290	19	864
Nugal	2	2200	14	570
Bari	2	1950	16	640
Mudug	6	11000	0	0
Galguduud	3	1900	0	0
Hiran	6	14375	0	0
Middle Shabelle	4	3250	0	0
Lower Shabelle	3	2050	0	0
Bakool	4	6750	0	0
Bay	8	3200	0	0
Gedo	4	2000	0	0
Middle Juba	3	3000	0	0
Lower Juba	3	4000	0	0
Total	65	66000	71	3654

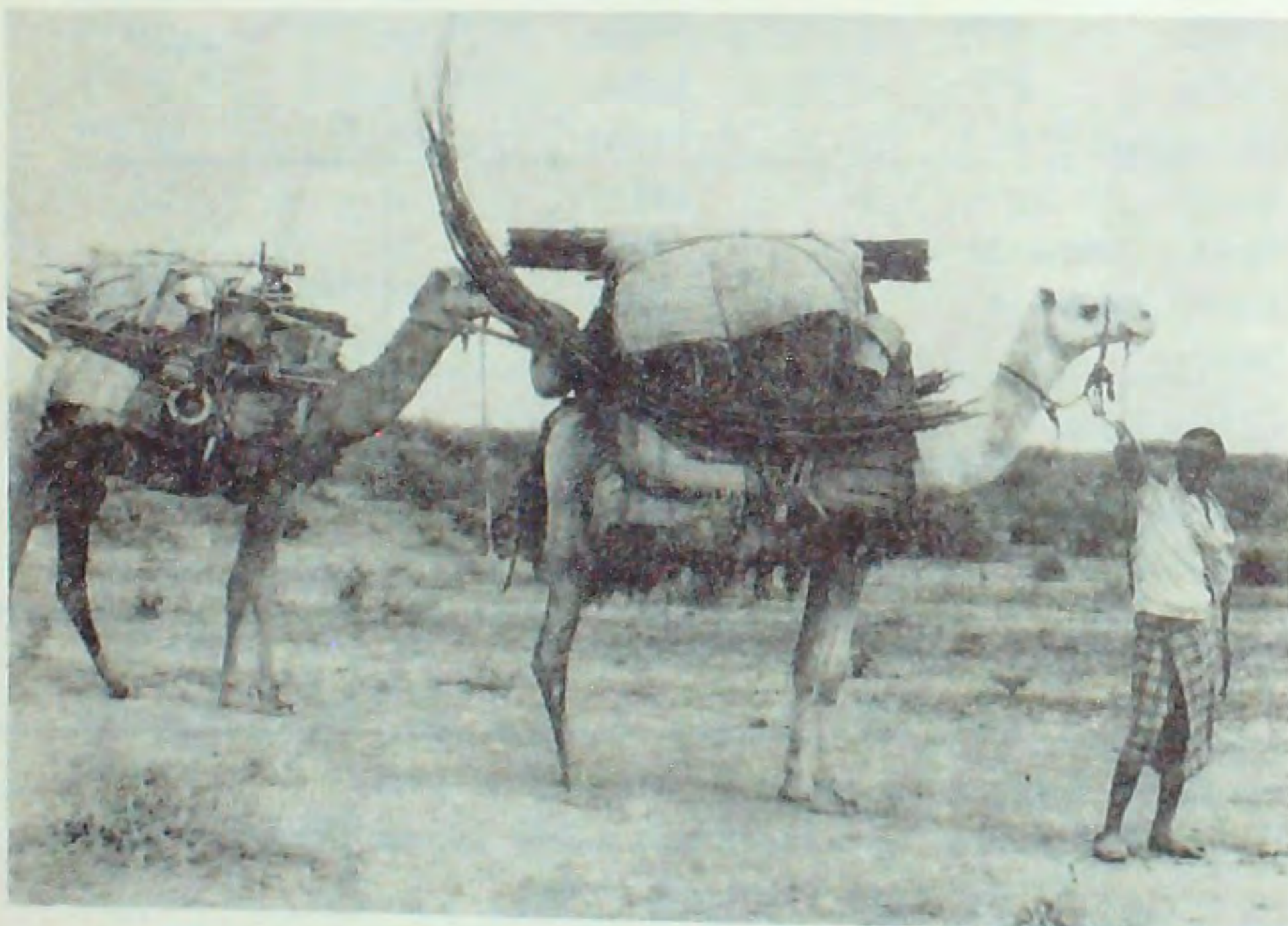
Table 6. Grazing reserves at the end of 1979.

(Source: Livestock and Range Sector Study, Ministry of National Planning, 1981)

The direct involvement of camels also in grazing schemes seems to be limited. The impact of stratified grazing and browsing access is twofold. Establishment of restrictions on migration opportunities will have repercussions on noma-

dic pastoralism and hence on production systems where camel husbandry is a component. Again, efforts to seek new forms for animal and range management should be made both from this point of view and in order to seek experience valuable in the context of camel pastoralism.

Figure 2. The nomads follow the rains in their search for browse for their camels. The camel is then used as a pack animal for transporting dwellings and other accessoires.



So far our presentation of the role of the camel has been more from a national economy and macro-political point of view. The greatest single importance of the camel is that it enables most Somalis to produce their food in a subsistence economy. This function has to exist under extremely varying conditions and desiredly also during drought conditions, once every 6 - 8 years.

A number of varying food production systems can be identified. One set would be agropastoral with a combination of farming and animal husbandry. Another would be pastoral with combinations of different species of livestock and/or diversifications of family herds into several management units. Whatever the food production system, one also has to consider how this is linked with the urban monetary system. This aspect requires a heavy emphasis.

Space does not allow us to present what the more specific forms for production systems will be like. However, the following section sketches their conditions in a more theoretical perspective. Its purpose is to create a baseline for research on various specific aspects of the camel and its husbandry.

Factors constraining camel pastoralism

Let us now move to the case of an individual pastoral household. In the simplest sketch a balance must be struck between (1) the number of individuals available in the pastoral enterprise, (2) the number of domestic animals and (3) "land", i.e. forage, water, and salt. Each of these components is depending directly or indirectly on the others. The herd size, for example, is not only a function of biological growth. It is also constrained by management decisions, herding practices, manpower available, forage and access to salt. Similarly, the human population com-

ponent relates to the food production of the domestic herd but also to the need of labour for efficient herding and husbandry. Thus there are both production and consumption requirements that have to be met for the family labour when the household's viability shall be maintained.

This very simple kind of model for a balanced food production system is of course not sufficient, since other factors complicate the picture or interrupt the balance even at a household level. (4) Given a risky life situation, individual households can diversify their productive activities into the fields of rearing other animals and into farming. (5) The penetration of a capitalist economy into that of camel pastoralism implies among other things changes in wealth distribution. The trend is that camel ownership becomes concentrated to wealthy strata of the population, and a reduction in herd size for the majority along with an increased economic diversification. (6) Another factor may be limited access to pasture, due to a growth of competing land use practices, for example over wet season pastures. (7) Labour migration out of a pastoral system is yet another factor. Today there is an acute conflict between the need of able-bodied men for the management of camel herds and the needs of the labour markets especially in the Middle East.

Another set of factors of relevance here is given by the historical development process: How did camel pastoralism turn into its present form and what are the possible future developments? Somalia is a unique country in that a majority (two thirds) of its population are nomadic pastoralists. This fact, however, has limited impact on the development strategy. The heavy dependence on livestock products for foreign exchange earnings is not reflected in the allocation of development funds. Attention is given to veterinary, marketing and intensive animal husbandry and

recently also to range management. The situation of the pastoral economy remains insecure and with little coordinated effort spent with the administration. Most efforts seem to be rather preventive and indirect, geared also at other activities.

Yet one set of factors within the pastoral system could be termed socio-cultural. Here we find, for example, culturally prescribed rules for wealth distribution and solidarity. The role of different kinship groups is significant in this context but is difficult to study, given the prohibition against them for other reasons. However, thorough studies are already available (cf. Lewis 1961 and 1981).

The kind of factors which we have outlined here give the context for camel pastoralism in Somalia. This being the case they will have to be integrated in the research activities of the camel project if this is to fulfill its outmost goal, i.e. to enable projections of alternative developments for the future. Such projections include (a) the extrapolation of the current situations with reference to constraints such as those touched upon above; (b) the identification of complementary activities to present production systems; and (c) the study of alternative camel rearing practices. In the light of the change of camel pastoralism towards more settled practices which occurs currently at a considerable pace, the need for coordinated community efforts increases, and special interest should be given to cooperative efforts, whether confined to marketing (within point b) or livestock production (point c).

The reproduction of camel herds and their food production

In the last two sections mention has been made of the role of the camel in the monetary economy of Somalia and of some

principal factors that influence camel pastoral systems. It has been stated that 80% of the Somali population rely to a considerable extent on animal husbandry for survival. On the average there is more than one camel per person in the country. The major economic role of the camel is obviously within the subsistence economy, and its monetary importance is functional of its role in pastoral systems. The two economic systems, subsistence and monetary, are not always compatible. The market value of one camel approaches SoSh 10,000 (1982), but even the owner of several camels can be impoverished since his camels are the only long-term source of income (in kind) for him. If he sells this capital, he will never regain it and must procure another livelihood.

Let us for a moment focus the attention on some management issues relating to food production from camel herds. Of course, in this short report we can only touch briefly upon some elementary aspects of the camel and its role in the lives of the nomadic pastoralists. The reader who wants a brief overview of the Somali case is referred to Taneja (1980) and Mohamed A. Hussein (1982). For some more comprehensive references see e.g. ILCA (1981) or IFS (1980), the former being a bibliographical review and the latter a collection of papers on different aspects by camel experts in various fields.

Taneja (1980:1) distinguishes between three different production systems based on animal husbandry:

- (i) "Camels, goats and sheep are predominant in five northern regions; typically the family unit keeps about 7 - 10 camels, 40 - 100 sheep and goats, and very few cattle.
- (ii) Camels, cattle, sheep and goats: in the central rangelands and in the interriversine area (Gedo, Bakool), camels are still the predominant species; a typical

pastoral family would keep 10 - 20 camels, 5 - 13 cattle and 20 - 90 sheep and goats.

- (iii) Cattle, camels, sheep and goats: In the Juba and Shebelli River valleys, cattle are the most important livestock species followed by camels. Typically, a nomadic household would keep 6 - 13 head of cattle, 4 - 5 camels and 3 - 30 sheep and goats."

To this list should be added at least one more production system, agropastoralism, whether there is a heavy reliance on animal husbandry supplemented with "take-a-chance" farming (Hjort 1981:137) or an economic base in farming with surplus channelled into livestock (Haaland 1977).

Since nomadic pastoralism is a risky undertaking, households seek as many complementary activities as they can manage. The limit can be expressed in terms of available manpower during the most demanding season. However, available manpower must be met by sufficient food production in the subsistence enterprise. When this condition is met, we say that a household is viable.

The identification of food production systems and the principles for diversification suggest that few households would rely solely on camel herds. A closer look at the reproduction capacity of a camel herd gives further evidence. This has been analysed by Dahl and Hjort (1976). The annual growth rate is low under balanced conditions for age and sex composition in a family herd, and it might take as long as fifty years to double such a herd. This means that a camel herd must be seen as a fairly constant resource compared with other species of livestock. It allows only for a limited off-take (1.5% - 7.5% annually seem to be the theoretical limits). Its greatest advantages as food producer is the fact that it is a more reliable milk producer than a family herd of cattle. A lactation period usually lasts a whole year. This means that even where re-

production is seasonal, there will be less fluctuations (though still severe ones) in the milk availability for human consumption due to seasonality than what is the case from herds of other species.

Of course, other important factors than reproduction traits must be considered; for example water and pasture conditions (to which the milk production responds immediately) and the fact that lactation drops markedly some ten weeks after birth. There is indeed an outspoken shortage in the supply of camel milk to the Somali markets towards the end of the dry seasons (compare Taneja 1980:2, who claims the opposite), when pastoralists may give their calves all four teats of milk or keep the remainder for household consumption. Similarly, in wet seasons a huge milk surplus is produced and wasted due to preservation difficulties.

Dahl and Hjort (1976:266) use a reference family of 4.9 adult equivalents in order to outline the nutritional demands from a family subsisting entirely on the products of a family herd. This family could be "a father around 30, a pregnant mother of 25, two children of 3 and 8 and two related youngsters, one boy of 18 and one girl of 15". If the family were to rely solely on camels, it would require a theoretical minimum herd of 28 camels. To this number must be added those animals that are needed to safeguard a viable family herd also after reoccurring drought disasters. Some animals are also needed for transportation.

The long term effects of severe droughts can be vital when they considerably increase the mortality rates in the camel herd. Dahl and Hjort (1979) demonstrate how such drought periods cause fluctuations in herd reproduction also many years after the drought has ceased. In order to counter the fluctuations, the household head may seek to borrow animals as one way of "filling a gap" in the age-structure. There are varying culturally prescribed ways of

doing this. Other important "rules" concern the transformation of wealth over generations ("inheritance") and the distribution of individuals into viable households with manageable herds. On the whole the adaptive capacity has to be considerable in the various pastoral production systems.

An understanding of the herd dynamics is one way of approaching the questions of how ecology, social organization and cultural systems relate. Such systemic knowledge is necessary for a proper insight into the conditions of pastoral production systems. Without it we fall in the trap of a "sectorial approach" (Baker 1975), trying to develop one side of the system without seeing all linkages to other parts.

On-going and planned subprojects

The need for research is great within the Camel Research Project. One of the principles of the project is that the bulk of the research work should be carried out by Somali researchers and that expatriate inputs should be kept at a minimum. The time schedule of the project has a rather low profile; the projects are implemented at a pace given primarily by the availability of qualified personnel. In consequence we expect the research activities to cover a longer time span than what foreign consultants might have to do.

Among the wide range of possible research projects the following ones have been selected:

- (I) Traditional camel husbandry project. The purpose of this project is to get access to and analyze the knowledge on camel husbandry of herdsman, in order to better comprehend the kinds of decisions that have to be made in different situations. Such a study is urgently needed in order to comprehend pastoralists' reactions

to various range development projects in Somalia. This fact has become apparent in integrated large-scale projects such as the Central Rangeland Project.

Figure 3. Weaning of camel calves occurs at the age of one to one and half years. One practice is to fix a piece of wood on the tip of the tongue. This hurts when the calf tries to suck the dam and shortly it will leave the habit of sucking.



(2) Camel milk analysis projects. These projects consist of a milk composition component and milk preservation/distribution research. The former can in turn be divided into two subprojects: a) Determination of inorganic components and some physicochemical parameters in camel milk; b) Characterisation of the caseins and fatty

Figure 4. The milk forms the subsistence basis for camel pastoralists. They can stay for weeks or months without any other food. Since the lactation period covers a whole year the supply is reliable. Moreover, one can milk a camel 5 - 8 times a day.



acids in camel milk. In subproject (a) the following parameters are determined: protein, fat, ash, total solids and salts. The intention with such measurements is to carry out long-term analysis of milk samples. The samples will be taken both from one static herd and from nomadic herds. The latter part of the programme requires controlled sampling with respect to browse, season and region. In all cases notion will also be made of lactation states, ages and other relevant biological data. The milk preservation and distribution components aim at making camel milk and milk products available to a wider range of consumers against the background of substantial seasonal overproduction. It seeks improvements in present preservation techniques and the viability of introducing new techniques. With improved knowledge about milk preservation follows the question how to reach urban markets. A pilot study is also proposed for the two-year period so as to sketch some structural patterns of current distribution systems. However, the major work input on the distribution side in this project lies further ahead.

- (3) Camel literature project. This project consists of a collection and an analysis of poems, proverbs and metaphors relating to various aspects of the camel. What remains to be done in this project is, first, to complete and revise the manuscript (ready by December, 1983), to arrange pictures, before having the manuscript read and commented in order to have it printed in Somali.
- (4) Camel health and disease projects. The activities under this heading include a general disease survey carried out at one or two slaughterhouses, a concentration on some of the features of the disease panorama of camels in Somalia, a pilot survey of brucellosis and toxoplas-

mosis in Somali camels, a study of the health status in a few nomadic herds, and a camel trypanosomiasis survey. Some of these activities are already well established, others are being started on a small scale.

Figure 5. Rather little is known in the literature about camel diseases. Therefore it is of paramount importance to carry out disease and health surveys in Somalia.



- (5) Camel breeding and reproduction. Much remains to be known about the reproductive pattern, breeding behaviour, etc. in the camel. Especially, no study has been made of the Somali camels in this field. (Some interesting work has been and is being done in neighbouring Sudan and Kenya.) Information about these "patterns and behaviours" is of importance as a base for improvement of management, breeding practices, etc.
- (6) Camel herd dynamics project. The purpose of this study is to seek the upper limits to increased milk and meat off-take under current management systems. One limiting factor is the slow biological reproduction capacity of the camel. Understanding herd dynamics is important also for a variety of other specific reasons: (a) Fluctuations and imbalances gear many of the management decisions; (b) They are related to variations in milk production; (c) They have a decisive impact on herd reproduction; and (d) They indicate the vulnerability of a herd to drought or other disaster.
- (7) Camel browsing and grazing project. During 1983/1984 the project will investigate three aspects: (a) The plant species camels eat; (b) The plant parts consumed (leaves, stems, etc.); and (c) The nutritive contents of the diet. Data collection will be made systematically in the field for nomadic herds in southern, central and northern Somalia. Other variables are: Ecological setting, season and age/sex of animal observed. Studies will also be carried out on the experimental herd. Here, a controlled vegetation study will be made of areas browsed and not browsed by the experimental herd.
- (8) The quantitative amount camels eat. This study is methodologically complicated. It can be supplemented with faeces analyses, so as to create a picture of energy conversions.

Figure 6. Much of the camel browse is on thorny bush which covers most of Somalia. No other domestic animal can utilize this pasture as efficiently as the camel does.



- (9) Camel marketing and commercialization project. In the first section of this paper we touched briefly upon the commercial importance of the camel. Even if camel rearing primarily is a subsistence undertaking, its

total impact in a capitalist economy is considerable. Its potential is thought to be much greater. Today's development process, though not geared by any political intention, is such that camel "ownership" tends to become more privatized along with more private control over, especially, water points and, hence indirectly, also over effective browsing control. Camels and camel products are marketed, and a cash economy is introduced in the pastoral household. This situation forms the background of the proposed study. It consists of one specific part, the study of camel marketing, and one more general, dealing with the overall commercialization tendencies.

The viability of the research

It is, of course, too early to make any efforts to evaluate the research approach tried in this project. We have already indicated a principal position regarding projections and the formulation of alternatives. However, one should also make a few reflections against the background sketched in the above sections.

The first has to do with practical aspects. We observe logistic and financial difficulties for individual researchers, a sometimes competitive relation between research and other activities, an equally competitive relation between the kind of research needed and the kind of research possible. These are all serious constraints on the project.

The second reflection concerns the applicability of research findings to development efforts. Here we feel the strength of localized research activities rather than short-term expatriate inputs. If the activities are permitted by circumstances to evolve a few years we feel that findings will indeed have a strong bearing on some development issues

that are crucial for the country, especially factors listed in section 2 above.

A third reflection touches on method. It is the explicit goal of the Somali Camel Research Project to be multidisciplinary. However, some disciplines are better represented than others in the research community, a fact which will set its mark at least in the volume of work put into each of the subprojects. It will most likely take some efforts in the future to maintain a multidisciplinary balance within the project.

A fourth reflection has to do with long-term and short-term. The perspective of the project is outspokenly long-term. The benefits of this include that the activities are anchored in the Somali research community. The drawbacks include a lack of quick results for immediate action. We note that, at least in the most clear-cut version, two development philosophies stand against each other.

Fifthly, as a follow-up, one observes the risk of fragmentation of the project. One may envisage a situation where subprojects well under way become "purchased" by financially stronger bodies than SOMAC or SAREC.

But even so, this may be a positive contribution of the project. For it is our strong belief that the camel is widely underestimated when it comes to issues of change in Somalia. On the other hand it is also our strong belief that development research has to be integrated both with a national research community and with the population concerned by directed development efforts. We have some doubts as to the benefit of the camel herders themselves, were one to drop on over-all multidisciplinary view and concentrate on a few aspects of immediate interest in a short-term perspective.

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Jörg Janzen

DEVELOPMENT PROBLEMS IN SOMALI AGRICULTURE
- AN OVERVIEW -

Introduction

The Democratic Republic of Somalia covers a surface of nearly 638.000 km², which is about 2 1/2 times the size of the Federal Republic of Germany. But the population is only estimated to be about 5 million people. In view of an average annual per capita income of US \$ 303 and other structural features of underdevelopment, such as high surplus of births exceeding 3% per annum, a very low average life expectancy, very high infant and child mortality, combined with low productivity in the agricultural sector, Somalia is statistically among the least developed countries of the world.

On the other hand it is not right in my opinion to characterize Somalia as one of the poorest countries in the world. Somalia possesses many resources, and an intensive exploration for minerals, gas and oil has only started during the last years. Particularly in the agricultural sector I consider considerable land resources still lie fallow, a point which I will discuss in greater detail below. As far as the development of agriculture in Somalia is concerned answers to two principal questions must be found:

- I. Which measures must be taken in order to make better use of agricultural potential and possibilities in the present natural, demographic, socio-economic and political circumstances?
2. What measures must be taken in order to integrate the

rural population into the nationwide development process, while at the same time abolishing systematically economic inequalities and regional disparities?

Before I turn to the problems of agriculture in particular, I should like to give a brief introduction into the agricultural structure and present some government initiatives which were launched in recent years for the improvement of Somali agriculture.

Characteristics of contemporary Somali agriculture

In Somalia about 22% of the population, which according to official estimates was about 1.14 million people in 1981, are engaged in agriculture. In the same year the agricultural sector accounted for about 7 to 8 per cent of the nation's GDP and contributes in 1980 approximately 8 per cent of export earnings, mainly by exporting bananas. The livestock sector is much more important; 2.9 million nomads, or 56% of the population are stock breeders. Livestock exports have contributed between 70 and nearly 90% of total export revenues between 1977 and 1980.

The present cultivated area is small in comparison with the amount of arable land available for cultivation. From 8.150.000 ha only 700.000 ha are under cultivation. Most of this land is only good for rainfed farming. Less than 8,6% of the estimated potentially arable land is cultivated; of these 700.000 ha only 50.000 ha, or 7.1%, are irrigated (fig. 1). Somali irrigation agriculture is concentrated in the alluvial plains along the rivers Shabelle and Juba, and to a small extent in the NW-Region around Hargeysa. Even in these areas only a small part of the potentially irrigable land is used for irrigation agriculture; 9% in the Juba Valley, 25% in the NW-Region and 41% in the Shabelle

Figure 1. Potential and present cultivated areas in Somalia (1982)

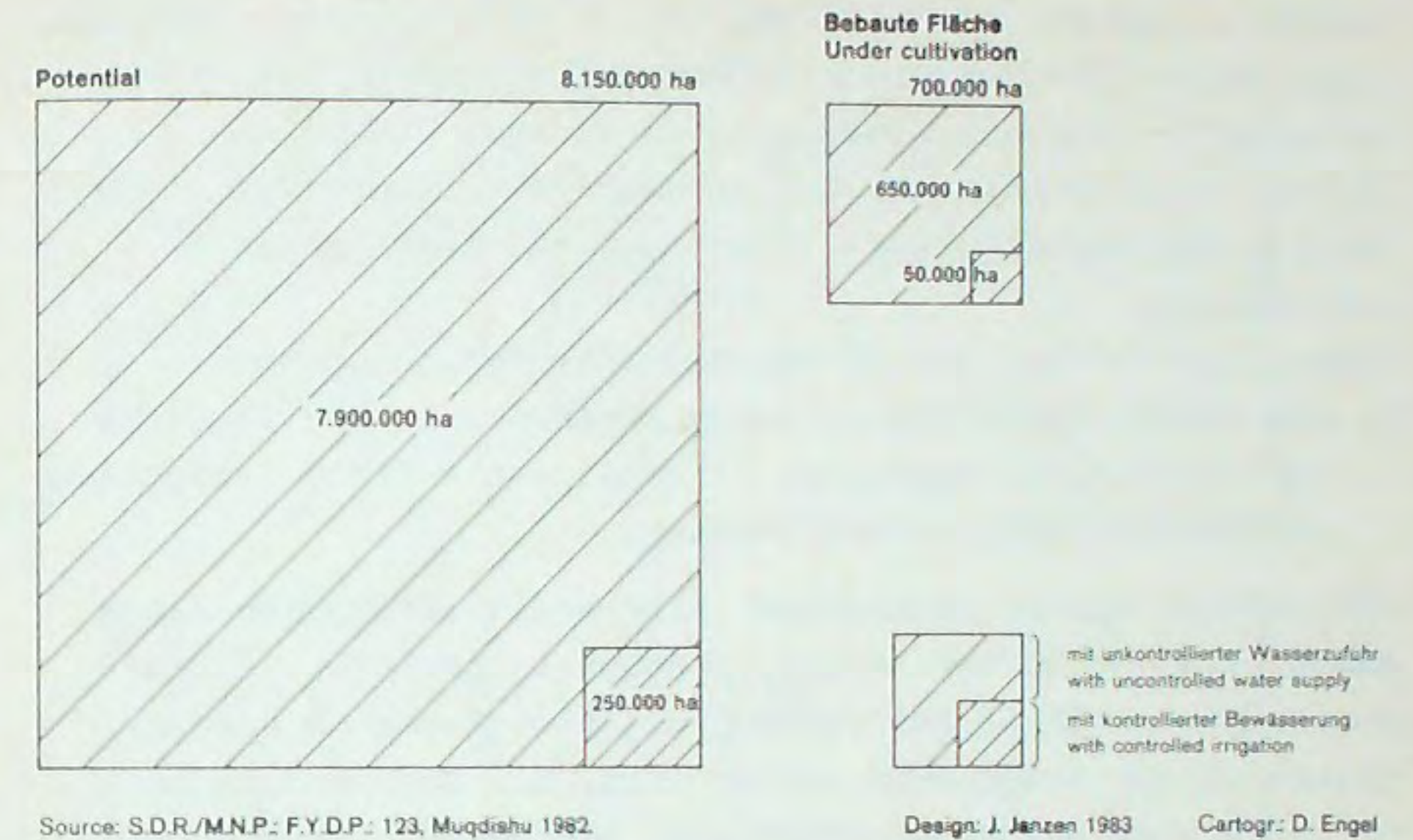
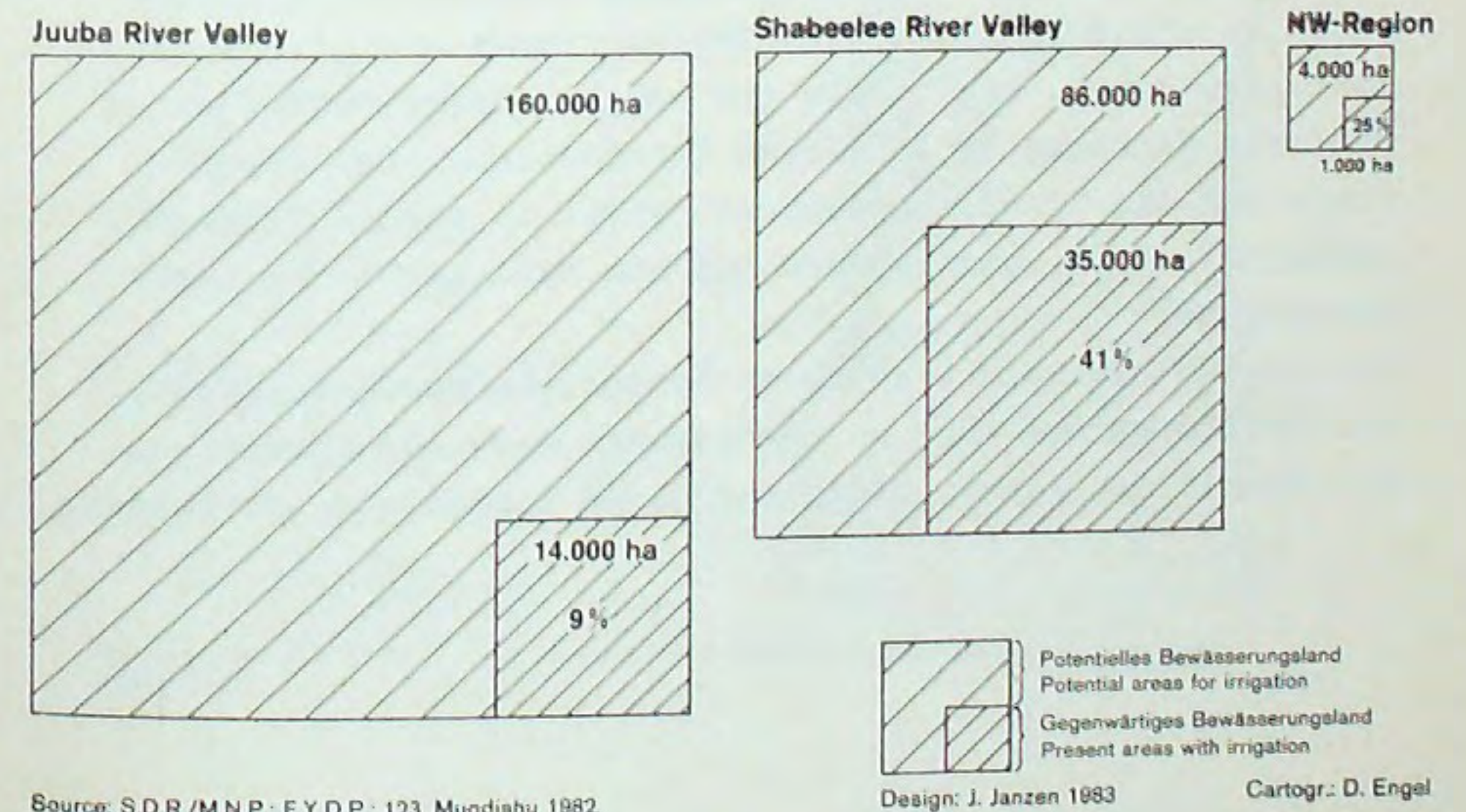


Figure 2. Potential and present cultivated areas under controlled irrigation according to agricultural regions (1982)



Valley (fig. 2). The bulk of the rainfed agricultural land lies in the interriverine zone where the average yearly rainfall reaches about 600 mm, and in the Hargeysa - Borama area, which receives about 500 mm precipitation per annum. But also in the more arid parts of central and north-eastern Somalia one can find an increasing number of plots for rainfed farming, very often near the settlements of semi-nomads.

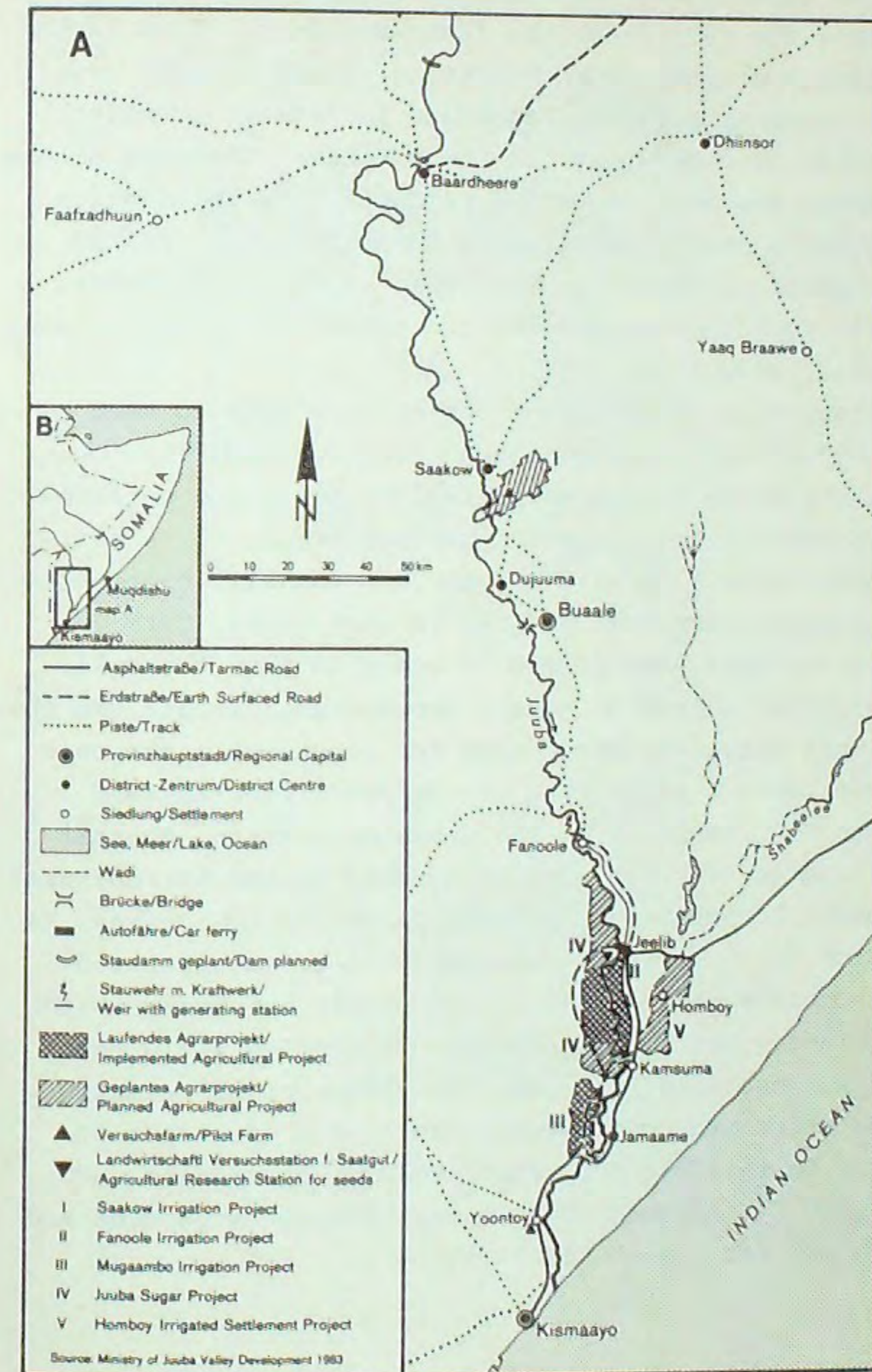
Somali agriculture can be divided into two subsectors:

1. the modern subsector of large scale irrigation farming;
2. the traditional subsector of small scale flood irrigation agriculture and rainfed farming.

The modern, highly mechanized large scale irrigation farms stretch along the two rivers of Shabelle and Juba. A high proportion of these new large irrigation farms is concentrated in the lower Juba Valley (fig. 3). The production of these plantations provides part of the necessary food for the urban population and is oriented towards the world market. The major crops on these modern irrigation farms are bananas, sugarcane, rice, cotton, grapefruits and, in smaller quantities, other fruits and vegetables. While the largest number of the banana plantations were founded during the Italian colonial period, other large agricultural projects have been established only recently or are still in the planning stage. The big farms are either privately owned, especially the banana farms, or represent projects financed by different international development funds and the Somali government. There is also a limited number of state farms, owned and run exclusively by the government.

The second subsector, which is by far the most important, is rainfed agriculture of the farmers and semi-nomads and the simple but rather efficient flood irrigation agriculture

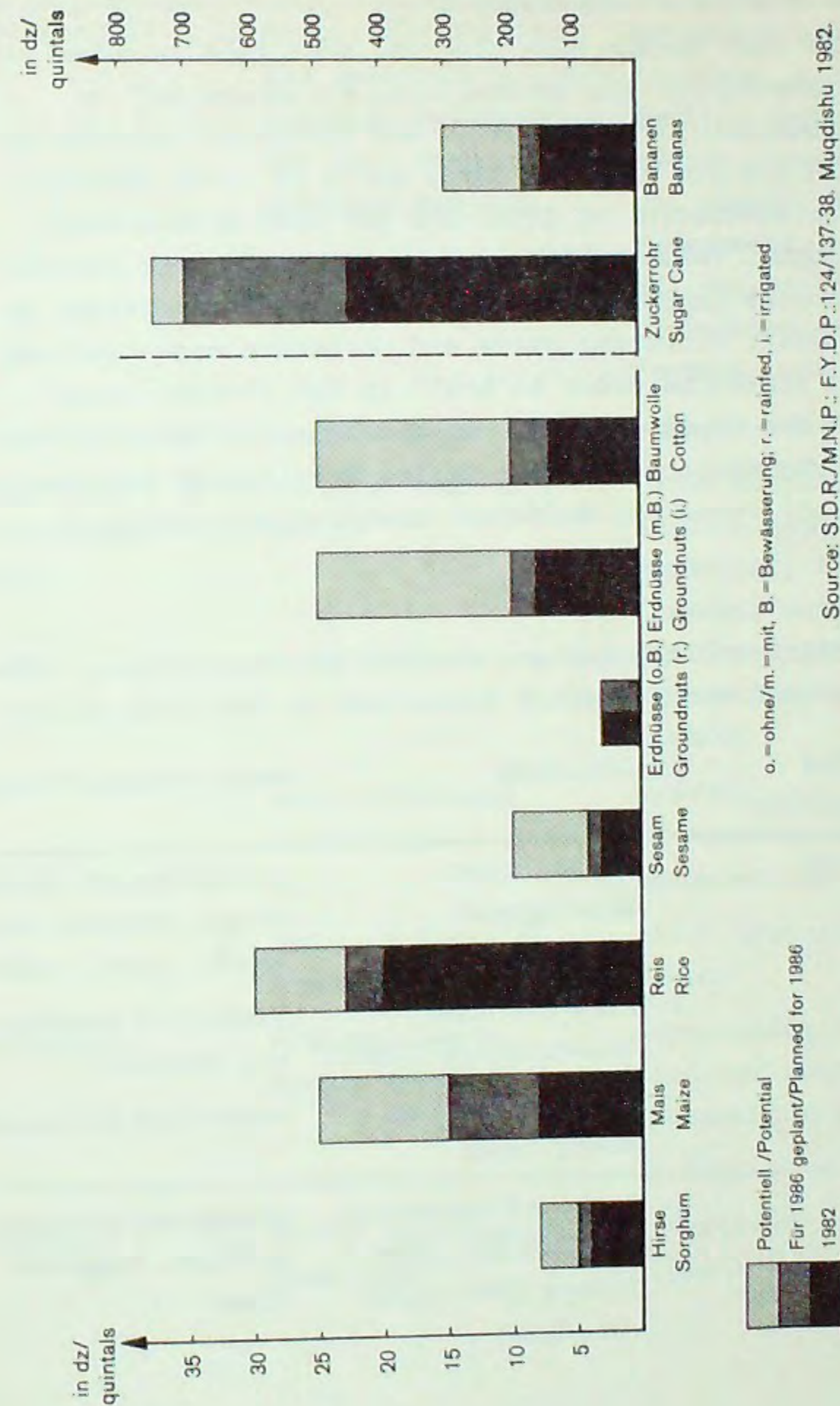
Figure 3. Large scale agricultural irrigation projects in the Juba Valley (1983)



agriculture found in the shallow depressions in the vicinity of the two rivers. In the Juba Valley these favourable areas for agriculture based on flood irrigation are called 'desheks'. The farmers of the flood-irrigation zone in the flood plains of the rivers cultivate mainly sesame, maize, in some areas groundnuts, beans and in smaller quantities other kinds of vegetables. In the Bardheera district onions and tobacco are very important products. The cultivation of sorghum is nearly exclusively limited to the rainfed farming areas on higher ground. Despite very low yields, maize and sometimes sesame and groundnuts can also be found on rainfed land.

The average size of the farms varies from area to area according to soil conditions and water availability. Unfortunately there are no reliable data available on farm-sizes in rainfed or irrigation farming areas. It is estimated that about 5 ha with sorghum are annually cultivated by the average farm family. Only in some areas, farm cooperatives have been formed in order to give the small-holders better access to modern agricultural inputs. In the traditional subsector production for subsistence purposes dominates. Only a small part of the production is sold either to the nomads or to the urban population. Another part of the harvest has also to be sold to the Agricultural Development Corporation (ADC) for fixed but low prices. As production in the traditional subsector is mainly based on unproductive methods and in the modern subsector there are still many unsolved problems, the average yield per hectare is generally very low. The yields of all plants could be increased considerably. Increases of yields of 30% would be possible for maize, sesame, groundnuts and cotton, 50% for sorghum and bananas, 60% for sugarcane and even 67% for rice production (fig. 4).

Figure 4. Yields per hectare of major crops



o. = ohne/m. = mit, B. = Bewässerung, r. = rainfed, i. = irrigated
 Source: S.D.R./M.N.P.: F.Y.D.P.:124/137-38. Muqdishu 1982.
 Design: J. Janzen 1983 Cartogr.: D. Engel

Potentiell /Potential
 Für 1986 geplant/Planned for 1986
 1982

Past and present government measures for rural development and their effects on agriculture

During the last decade many programs have been launched in order to ameliorate the agricultural structure and to raise production. A basic social and technical infrastructure which did not exist in large parts of rural Somalia before the Revolution of 1969, has now been established. Without doubt, these achievements are an important contribution towards improving economic and living conditions in rural Somalia. Different state and parastate organizations have been formed in order to build up the institutional framework for rapid agricultural development. Table I, compiled in the Ministry of Juba Valley Development for the Juba Region, shows the different institutions and their functions.

Table I. List of Institutions serving the Agriculture, Livestock and Fisheries Subsectors in the Juba Valley

Ministerial Responsibility	Institution	Main Responsibility
Agriculture	1. Agricultural Development Corporation (ADC)	marketing of sorghum, maize, cotton, oil-seeds, rice, seeds
	2. Farm Machinery Organization (ONAT)	hiring of mechanical services
	3. National Banana Board (NBB)	marketing of bananas
	4. Dept. of Agricultural Cooperatives (since 1981 independent)	promotion of agricultural cooperatives

Ministerial Responsibility	Institution	Main Responsibility
Agriculture	5. Dept. of Production and Extension / Agricultural Extension and Farm Management Training Project	extension service, training, seed production and certification, credit, input supply, farm management, monitoring and evaluation, plant protection and locust control, research
Livestock, Forestry and Range	6. Dept. of Animal Health	Serum and Vaccine Institute Mogadishu; Veterinary Laboratory Kismayu; veterinary field service; meat inspection; tsetse control
	7. Dept. of Animal Production	breeding and selection of animals; artificial insemination
	8. Dept. of Planning, Training and Research	staff training, research
autonomous	9. National Range Agency (NRA)	development of rangeland and environment; research; training
Finance	10. Somali Development Bank (SDB)	investment and development loans

Ministerial Responsibility	Institution	Main Responsibility
Finance	II. Commercial and Savings Bank	short-term credit
	I2. National Trading Corporation (ENC)	marketing of sugar, edible oils, tea, wheat, coffee, pasta products

Industry	I3. Kismayu Meat Factory	meat
	I4. Tannery Kismayu	hides and skin processing
	I5. Fish Freezing Kismayu	fish

Bureau of the Somali Revolutionary Socialist Party	I6. Crash Programme Agency	agricultural production, training
	I7. Settlement Development Agency (SDA)	settlement of drought and war refugees

Source: Ministry of Juba Valley Development, Mogadishu 1983

During the Five Year Development Plan (FYDP 1974 - 1978) 29.1% (I.282 million SoSh) of total investment funds were allocated to agriculture, while the figure in the Three Year Development Plan (TYDP 1979 - 1981) was 23%. Despite considerable efforts to increase food production, none of the three main objectives for agriculture during these periods:

1. to reach self-sufficiency in food production by the end of 1981;

2. to increase agricultural incomes;
3. to raise agricultural exports

could be attained. An exception are the banana-producers, who seem to benefit from the devaluation of the Somali shilling on the Arabian and Italian markets. There is also some progress in diversifying the agricultural sector by establishing new grapefruit plantations. An important step forward in order to be able to decrease sugar imports is the opening of the Juba Sugar Complex.

Major problems of present agriculture in Somalia

This short overview of the main characteristics of Somali agriculture and the measures taken by the Somali government in order to improve agricultural production has already pointed to many problems facing agricultural development in Somalia. Of the manifold problems I should like to discuss only the most important.

The principal causes hindering agricultural development in both, irrigation and rainfed farming, are physical-geographical factors, and, in particular, problems resulting from the present socio-economic and political conditions.

Physical-geographical factors

1. Low and irregular rainfall resulting often in low yields and even in complete harvest failures. Mainly rainfed based agriculture suffers extremely from the uncertain amount of available precipitation.
2. On the other hand it happens rather often that heavy rainfall in the regions on the upper courses of the Juba and Shabelle leads to uncontrolled flooding of the river flood plains, resulting in enormous destruction of fields, irrigation channels, harvests, settlements etc. Only barrages, like the planned Badhera dam or weirs with link

canals to huge water storage facilities, like those near Jowhar, can help to avoid such destruction. With such storage facilities controlled flooding of the desheks and better possibilities for the irrigation in the large agricultural projects would be possible.

3. A high rate of evaporation supports the accumulation of minerals in the soil and causes severe salinity problems on agricultural land. Salinity is aggravated by bad drainage facilities in some of the large irrigation projects, e.g. in the Jowhar Sugar Complex.
4. Soil erosion by wind and water, mainly in areas of rain-fed agriculture, leads to great losses of fertile soil. Particularly in the drier central, northern and north-eastern parts of Somalia, soil erosion is more obvious than in the south, resulting from the destruction of the vegetation cover by overgrazing, from cutting bushes and trees for enclosures, and from digging a network of small ditches for the collection of additional sheet-flood water for fields and cisterns (berkeeds).
5. Plant diseases, insects and especially birds cause heavy harvest losses, particularly in grain production. New methods of bird-control should be introduced.
6. High losses of grain to pests and vine-mildew, also result from inadequate storage facilities, both, the underground pits of the farmers and the large storage buildings of the ADC. Other kinds of storage systems should be introduced.

Socio-economic and political factors

1. The fact that according to pastoral tradition stock-keeping has a much higher prestige than farming, makes it very difficult to convince nomads to settle as farmers or to become labourers on the large irrigation farms.
2. The enormous lack of manpower is one of the key problems.

The relatively low prestige of farming amongst the nomadic population, together with the high migration of manpower attracted by high wages and favourable working conditions in Mogadishu and the oil-producing Arabian countries, is another reason for the enormous lack of skilled and unskilled male farm labourers and managerial staff, needed in the large irrigation projects of the Juba and Shabelle Valleys. An increasing tendency that women and children replace the male labourers can be observed. In the nomadic agricultural settlements of Kurtunwarey and Sablaale only a small percentage of men are present. In the irrigation projects of the lower Juba region the largest part of the labourforce is recruited of the nomadic settlements. These jobs give the women more independence from their husbands, a fact which is disliked by the majority of men and causes a lot of problems within the families.

3. The lack of sufficient social and technical infrastructure and non-agricultural possibilities of income in the rural areas of Somalia support the emigration process from the peasant-nomadic living space.
4. The majority of the Somali farmers possess only a small farm and produce at a very low level of productivity and have nearly no cash income. Since their yields are very small they predominantly produce for themselves. Therefore their contribution to food supply for the urban population is low and the government is obliged to import large quantities of basic food.
5. The large number of state and parastate institutions involved in development planning in the rural areas is a disadvantage because there is a lack of cooperation and coordination. This fact leads to delays in implementation of projects and involves high costs for administration.
6. Over-ambitious targets and delays in delivery of equip-

ment, spare parts and agricultural inputs seriously affected plan implementation. A very severe problem is the supply of spare parts for the Russian machinery, because all economic relations with the Soviet Union have broken off since their expulsion from Somalia.

7. The development measures launched by the government benefited particularly the large-scale irrigation projects. The small farmers did not benefit from these projects, on the contrary they even lost part of their labour-force to these big farms.
8. Last but not least, the availability of basic data on the physical environment and the socio-economic conditions is the most important pre-requisite for a reasonable development planning. These data are incomplete or non-existent for large parts of the country.

Conclusions and some proposals for future development in rural Somalia

After this brief and rough overview of the structure and problems of Somali agriculture I should like to try to give an answer to the two questions that I presented at the beginning by making some proposals for future development.

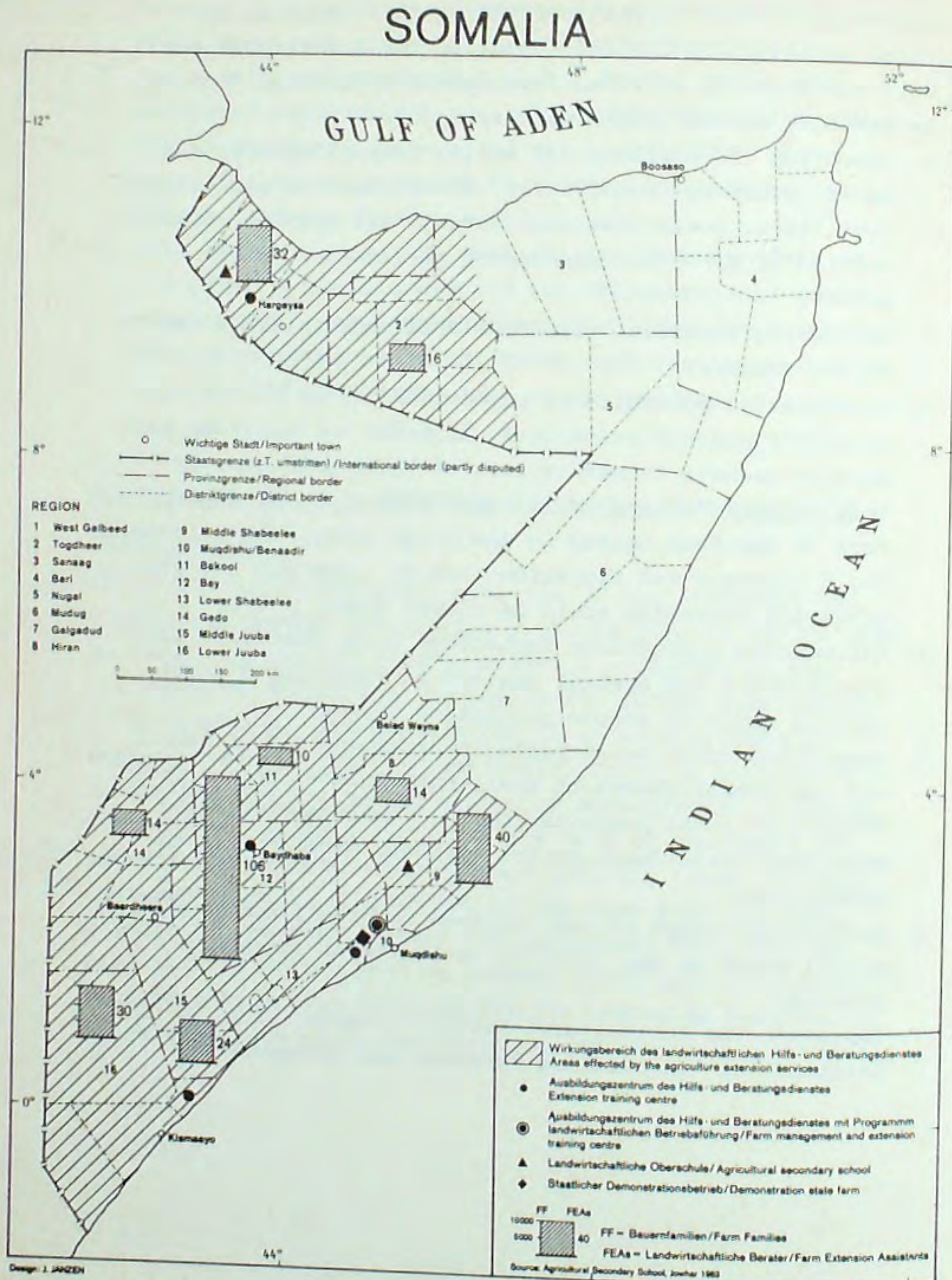
We have seen that Somalia has to solve a variety of problems before attaining self-sufficiency in basic food production and increasing export of agricultural products. Furthermore, it is a fact that the bulk of the money for investments in agriculture flowed into the large new agricultural irrigation projects. At the same time the agriculture of the smallholders was neglected. They work the largest part of the land at present under cultivation and produce most of the basic foodstuffs needed in Somalia. A prime objective of future agricultural development should

therefore be to give special attention to the smallholders.

In order to ameliorate the economic and living conditions especially of the majority of the small farmers in the rural areas of Somalia and stimulate self-confidence and self-sufficiency, existing development initiatives should be extended and new measures introduced:

- I. Improving the physical and social infrastructure (e.g. construction of roads, wells, water channels and storage facilities, power stations, schools and clinics, introduction of a mobile jeep-doctor service for remote areas);
2. increasing financial resources available as small credits to the farmers;
3. assimilating agricultural production prices to the country's average price level in order to stimulate subsistent farmers to market part of their products. By this measure farmers could contribute a higher percentage of the food needed in the urban areas, their income would increase and migration towards towns and the oil-producing countries could be slowed down;
4. introducing appropriate technology (e.g. windmills to supply water and energy) instead of complicated machinery in order to reduce production costs;
5. supporting rural handicrafts in workshops and at home and the establishment of small enterprises for the processing of local products for the Somali market would have positive effects on the economic situation in the rural areas.
6. increasing output of well-trained technical and managerial staff on the level of agricultural secondary schools.
7. improving the Agricultural Extension Agency (fig. 5) by intensifying the existing services and extending the

Figure 5. Distribution and facilities of the Agricultural Extension Services (1983)



material assistance and education programmes to the more remote areas for the benefit of the smallholders and semi-nomads (e.g. the introduction of better production techniques, seeds, irrigation and drainage systems, credit facilities, the reasonable use of artificial fertilizers and pesticides, and the establishment of small-scale training facilities;

8. ameliorating the maintenance of farm machinery by employing more and better qualified mechanics and supplying more spare parts;
9. providing water facilities for the farmers and especially for the semi-nomadic population at a greater distance from their settlements according to their traditional migration pattern in order to prevent overgrazing at the outskirts of the settlements;
- IO. stopping any kind of organized sedentarization of nomads in agricultural projects. The disappointing results of Kurtunwarey, Sablaale and Dūjuuma should be a warning. Instead of settling nomads, sufficient facilities (water, education, health, etc.) should be provided to the pastoralists according to their traditional spatial pattern of migration;
- II. for agricultural development to advance successfully much basic research in all fields has to be done. Research not only in natural sciences but also in social sciences, like economic and social geography, sociology, ethnology/anthropology, etc. are an important pre-condition for the creation of a solid data basis for future development planning, the prevention of severe planning mistakes and the maintenance of the fragile ecological balance of the environment, typical for large parts of Somalia.
- I2. nation-wide development programmes in rural Somalia should be planned and implemented according to the real needs of the majority of the rural population. Large-

scale agricultural projects should not play the main role. And in areas where such large projects are being established, like in the Juba Valley, development planning should be done in close cooperation with the local farmers and nomads in order to prevent future conflicts between them on the one side and the new settlers and government officials on the other.

For the period of the present FYDP (1982 - 1986) considerable funds have been designated for the improvement of crop production (723.4 million SoSh) and irrigation schemes (4036 million SoSh), i.e. 4.4% or 24.8% respectively of the total development budget.

It remains to be hoped that at least a significant part of this money will be employed within the framework of the proposals and that by this a better integration of the smallholders and semi-nomads within the nation-wide process of development may be attained, for the benefit of the rural population and the Somali economy.

FOOTNOTES

- ^I In this article the livestock sector is neglected and the term 'agriculture' is used in the sense of crop production under rainfed and irrigated conditions. The paper is based on two periods of research work in Somalia in spring 1982 and 1983. The statistical data are taken from the reports listed below.

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Adriano Varotti

SUGGESTIONS FOR THE STUDY OF CURRENT TRANSFORMATIONS
OF SOMALI AGRICULTURE

Introduction

Somali economy and more generally Somali society, despite the deep and rapid processes of change which affected them in the last decades, do not seem to have definitively overcome the problems handed down from their past history. They are problems deriving from the relationship between a traditional society and colonialism first, later, the developed countries. The obstacles are those common to most countries which are trying to set up a self-propelled mechanism in the economic sphere within a general political and social process of social integration.

While most emerging African countries are characterized by deep, at times dramatic, ethno-cultural conflicts, Somalia is remarkably homogeneous. There is a widespread feeling of common identity and exclusiveness which gives rise to what I. M. Lewis (1961) defined as "cultural nationalism".

This means:

- an ethnical identity or a common descent from Arabia (represented in the national genealogy) which acts as a "historical mixture", as a primary principle including the whole of the Somali people;
- a common language which acted as a powerful unifying and communication element, thanks also to the mobile character of a pastoral society. In its recent written form, the language is providing exceptional impetus to the process of national integration;
- the practice of the Muslim religion which unifies the Somali population while at the same time differentiating

them from their neighbours. As a universalistic religion, Islam can favour the transition from a family (clan)-based solidarity (corresponding to a segmental, traditional society) to one corresponding to a developed and generalized division of labour and of social functions on a national scale.

Agriculture in the context of Development

Like all emerging countries (with the only exception of those with considerable mining and/or oil resources), Somalia is basically a rural society. This is not so in a quantitative sense only, as most of the population and of national resources are linked to agriculture.¹ Improved living conditions of a large part of the population (especially because of the decline in child mortality) produce the well-known effect of a demographic boom.² They result in a rapid population growth which is higher than production increase rates. On the other hand, however, general economic development and the process of national integration progressively lead to the expansion both of the population not employed in agriculture and of the ones that are not productive in a strict sense.

Economic development, in fact, necessarily produces the multiplication of the social division of labour within the economic system (hence the rise and development of new productive sectors and the widening of industrial employment) and the expansion of the tasks of the state organization (with a parallel increase of public employment).³ This takes place according to rates and times which are each time the result of specific political choices and of specific international economic constraints. The processes mentioned above produce both a rapid growth of urban centers⁴ and a larger

and stronger business sector which is called to meet demands and supplies ever more differentiated and socially distant the one from the other.

Urban development - and the wider system of needs it implies - and the process of differentiation of the productive structure lead to a growing levitation of the demand towards foreign markets - both for new consumption goods (new as against the 'archaic model' of traditional society) and for instrumental goods. This demand, in connection with the heavily negative trend of the exchange between exported and imported products, gives rise to loss of capital, monetary instability, weak savings, inflation, etc. Thus, international economic relationships lie at the bottom of the 'fatal' persistence of underdevelopment.

There follows from what already said (increase in total population; decline of agricultural employment; need for new investments both to increase industrial production and to cope with the most urgent social needs; unfavourable foreign exchange) that the only possible path towards economic development is that of enlarging output and, even more, productivity of agricultural labour. Even though necessary, this process is not an easy one. It should be mentioned, in fact, that:

I. Somali agriculture has not been and is not being affected - except to a limited extent - by the technological innovations through which human labour is replaced by mechanical (or animal) labour, thus producing the expulsion of the rural population.⁵

Because of the absence of pockets of permanent unemployment and underemployment, the exodus from agriculture - which has been increasing in recent years⁶ - results in a contraction of agricultural output which in turn is followed by an increase in urban unemployment, owing to the present lack of occupational outlets in the industrial

sector.

2. Given the present state of the productive organization of the sector, only a very small number of its productive units have a certain amount of surplus. The current productivity levels are such that chances of financing extra-sectoral activities are extremely limited.

So far we have insisted on the existing limits to economic development, but (also to avoid a charge of 'catastrophism') it should be immediately stressed that, at least at the technical-agronomic level, there is considerable room for a positive solution of the problems mentioned above. The unitary output of the two most important agricultural products (strictly speaking, i.e. with the exclusion of breeding) which alone cover 80% of all cultivated land - i.e. broom-corn and maize - is ten times lower than that of the more developed areas.⁷ It is true that the increase rate of the world food production per inhabitant has been higher in recent decades than the demographic increase rate, while the case is reverse in the underdeveloped countries, to begin with Somalia.⁸ It is equally true, however, that the achievement of a sufficiently realistic goal such as outputs equal to at least half those of the more developed areas, would permit to overturn the current trends with regard to the existing relationships between production and population increases.

There is at least the possibility to oppose the current, and growing, dependence on foreign markets for satisfaction of the basic need for food.

The important choices of economic policy in the last decades show that agriculture has been considered as the 'leading sector' in the early phase of the development of the country. Aside from some perplexity in the time immediately following independence, the 'industrialization myth' - though wide-

spread - did not take roots. The government officials entrusted with development policies did not embrace the idea that, in order to raise rapidly the rate of growth of the economy, the only way was necessarily represented by an industrial structure diversified and technologically similar to that of the advanced countries.

The study of the social structure as central to an analysis of the current transformations of the sector

Let us start with a general statement. Economic development is never the result of the variation of technical elements only, i.e. of the utilization of new and more complex instrumental goods. Any revolutionary technical change necessarily implies deep modifications of social relationships, meets with the resistance of specific economic subjects and is, at the same time, the product of needs and choices made by equally definite social groups. The specific social character of any productive activity is central to the study of agriculture in modern industrialized societies as there continue to co-exist in them productive units that are markedly differentiated with regard to their respective social figures.

An analysis of sociality, however, is even more necessary for the study of the societies under consideration. In fact, the global social structure of the Somali primary sector is characterized by the fact that, side by side with agricultural production, there exist other 'economic-social blocs' predominantly if not exclusively involved in production for self-consumption and each endowed with specific social and productive structures. Also, each of them reacts in a specific way to the general transformations of the country's economy and to each individual intervention of agrarian

policy.

Aside from the objective limits concerning the available resources to promote agricultural development, the problems related to the specific nature of the sector structure and to the peculiar processes of transformation, both in progress and to come, are enormous.

Furthermore, the existing knowledge about the sector is extremely lacking. The economic activity carried out by foreign experts has left very little mark in the scientific literature. There is no research or systematic reflection on the sector's situation and, particularly, on the various processes of change that are in progress in its various parts. Because of this lack - which is common to most emerging countries - the discussion about economic development is often floating between opposite positions, all equally distant from reality. Some give preference to an ethnographic approach and describe (often with a pinch of 'economic romanticism') agricultural labour as an activity void of contradictions and separated from the general processes of socio-political transformation. Others, on the other hand, mechanically adopt the results of studies of the organizational forms of production in the more advanced societies. On the one hand, one simply stresses the cultural specificity and the biological-natural dimension of agricultural labour; on the other hand, the most advanced productive techniques are emphasized regardless of the specific social reality in which these techniques should operate.⁹

Statistical information about and surveys of the social structure are also insufficient. In general it can be said that the knowledge-formation process is not up to the complexity of the existing problems.

We shall try to describe this complexity in the following pages, albeit in very general terms.

The general structure of agriculture

In order to define the structure of the sector and to identify the 'big compartments' of which it is made up, it is necessary to make reference, albeit briefly, to the history of the country, as this is the expression of the most important economic and political events in the last century. In Africa south of Sahara, and even more in Somalia penetration of capitalism into agriculture took place relatively late. Unlike most countries of the African continent, however, in Somalia there was no juxtaposition of advanced economy on the local rural one - a juxtaposition which elsewhere produced immediate and profound modification of the indigenous social structure.

The world of herding

The progressive expansion of plantation capitalism since the beginning of the century has neither destroyed nor significantly modified the dominant local agriculture, i.e. herding. This has been due to the fact that neither settlers nor big Italian capitalist enterprises settled in the zoo-technical sector. This, in turn, is related both to the "lack of serious experiences from which indications could be drawn to strengthen breeding practices" (Mangini 1953: 208) and, even more, to the excellent opportunities provided by intensive investments in the production of export goods.

Another basic cause for the lack of change in herding should also be mentioned, i.e. its peculiar social and productive organization. Herding, characterized for many centuries by the struggle for existence, with a flexible productive structure and a considerable degree of internal specialization, "is not far from embodying the maximum possible total output, in the framework of available resources and techniques", as noted Querini (1969). But - and

this seems to be decisive from the point of view of a global historical assessment - unlike what happens in many other African countries, it is a form of productive organization which is placed in a wider social and cultural structure, essentially lacking a centralized authority. The only stable basis of the individual's legal and political status in a mobile society, scattered and lacking the authority of an economic or local power, is the clan. The wider structure in which the nomadic unit of herding is placed has no centralized power, nor does it include a hierarchy of statuses mutually defined by domination - dependence relationships, but, rather, differentiated statuses of individuals and families basically linked to their belonging to specific clans or to their owing a superior zootechnical patrimony (see Meillassoux 1978). As shown by many studies, traditional societies that lack centralized power (such as those generally defined "tributary societies") "tend to resist economic and political transformations and to preserve themselves as systems of values for much longer than the historical stage they correspond to" (Stavenhagen 1971:55).¹⁰ On the contrary, all traditional structures of the underdeveloped world which were characterized by

"class structures with oppositions, conflicts and antagonisms based on exploitation and on the economic (...) and political domination of one class over the other, have not been able to resist the impact of European expansion without undergoing radical modifications" (Stavenhagen 1971:55).

This traditional 'economic-social bloc' has not been but superficially eroded by the rise of new and more powerful political organizations and by the expansion of mercantile relationships following colonialism. Later, however, even when the country became independent, very few and modest

modifications occurred.

The causes of the invariance of the productive organization of herding can be identified in a series of strictly inter-related elements:

- various attempts at raising the sector's productivity such as the opening of wells and the setting up of water-raising systems, the building of watering posts, the preventive treatment of cattle, the improvement of pastures, etc. had little effect;
- exchanges with other productive sectors for securing instrumental goods are practically non-existent;
- the productive structure reacts with little flexibility to variations in the price of breeding products, as self-consumption is predominant over selling and it is very difficult to bring about variations in the combination of existing factors;¹¹
- relationships with the labour market as regards the labour force are irrelevant;
- productive socialization is absolutely autonomous and totally comprised within the productive unit;
- non-traditional productive units with a predominant zootechnical orientation are practically non-existent within Somali agriculture. There lacks, thus, a directly competitive and more productive sector which could help spreading innovations and, by way of a decrease of prices of zootechnical products, produce a crisis of the weaker traditional units which entertain strong relationships with the market.¹²

These are in brief the reasons why 'herding' is basically unchanged: the reason why, aside from the frequent and lately profound crises related to long periods of drought (crises that have constantly affected the herdmen's life and patterned the very organizational structure of pastoral

life), the organizational form of the individual productive units is unchanged nor does it show basic variations as a whole.

However, following the deep political and social modifications of the country in the last years, the relationship between this traditional sector and the global society has indeed changed. Its general functions, its role on the strictly economic level and on that of the overall social balances have changed - even profoundly so. In the future, deep changes may ensue within the sector and some clues may already be detected.

There is, first of all, a clear and progressive decline of the relative weight of the population in the sector; while, until shortly before independence, over 80% of the Somali population was directly involved in cattle breeding, now there is less than 60%.¹³ But the actual decline on the general social and cultural level is far greater than appears from the demographic data. The process of national integration and, particularly, the acceleration of social changes sparked by the political events of the last decades, have in fact made for a decline of the 'autonomy' and relevance of the pastoral world on the general social level and, at the same time, for deeper ties with the rest of society. Though to a still limited extent, herding has thus begun to receive external stimuli and 'needs' which have in turn determined now - albeit limited - behaviours. Looking at the shepherds' consumptions in the last decades one notices the emergence of new - even though modest - goods (tea, sugar, new textiles, etc.) which to a certain limited extent have made for the widening of the material necessities of traditional 'archaic poverty' and, at the same time, for the strengthening of its ties with the market.

Beside material consumptions however, there emerge within

pastoral culture new needs that can only be satisfied through a closer relationship with public institutions: the need for health assistance and education.

Even more significant is the fact that closer contacts with the 'global society' have produced, especially among the youth, new needs chiefly related to the sphere of sociality more than to possession of material goods. As these needs could not be met within the productive units and the 'world' of herding, they caused the exit from the sector into either village agriculture (or a sedentary pastoral-agricultural activity) or, in many cases, urbanization and, also, (temporary) emigration abroad. Social figures extraneous to the herding world have become more relevant and new ones have arisen, such as the migrant labourer - a figure which is very widespread in most African countries.¹⁴ At the same time, both as a consequence of a greater sensitivity to available money and of favourable prices of the main zoo-technical products, the sale of certain kinds of animals has increased in the last years, partly on the national urban market and, even more, on the foreign market.¹⁵ Thus, though scarce resources, both domestic, and especially, from abroad, have progressively concentrated in the urban centres and in the plantation sector (basically: bananas), most of the Somali population still depend on herding for their subsistence. In the last years, furthermore, this is practically the only sector which fulfills a basic economic function: that of providing foreign currency as can be seen from the following table.

We can conclude that, on the one hand, it is true that recent social and economic dynamics have made for the strengthening of this area of Somali agriculture; but, on the other hand, this has not so much been the result of a real and decisive progress within it as the reflex of the difficulties of the other areas (especially that of banana

production).

Table I. Relative shares of agricultural sub-sectors in key economic parameters (per cent)

Sub-sector	population (1978)	exports (1978)	actual investments in 1974-1978 plan
Irrigation and agriculture deve- lopment	19	14	96
Livestock and range development	81	86	4
Total	100	100	100

Source: Computed from various sources

An appreciable improvement of productive techniques, hence an increase of work productivity, have not taken place; and for the reasons mentioned above regarding the basically unchanged structure of the sector, they will probably not take place in the future. Its basic 'rigidity', therefore, suggests more a possible disintegration - even though contained in time - than a real productive evolution. This is clearly one of the crucial questions of Somali agriculture and, more generally, of Somali society, given the economic and demographic centrality of this socio-economic bloc.

The "peasant community"

Let us now consider the characteristics and the main developing lines of the other 'compartments' within the agricultural sector. Let us begin with the second component of the traditional Somali agriculture: the "peasant communities". This is the whole of the productive units that predominantly

if not exclusively produce for self-consumption. They are units based on the self-employed labour of the owner of the basic means of production, and of his family. These units, also, both on the social and cultural level, are integral parts of specific social units such as the village communities. These villages are made up of a not very large number of families that are very homogeneous with regard to the means owned, the agricultural techniques used and thus the level of consumption: they have a high degree of overall autonomy. This autonomy is reflected in a local authority solely appointed by the members of the group. In a basically autonomous way this authority defines and guarantees fundamental social rules such as forms of possession of land and instrumental goods, rules of group membership, relationship with other groups, etc. In these villages, thus, a large part of material and cultural needs are met from within. We have chosen the term "peasant communities" to underline their high degree of integration and autonomy, without however sharing all that has been written on the subject in anthropological literature.

These peasant villages are markedly different as to their social structure both from the "pastoral community" and from "modern villages". As against the former, in fact, members of the peasant communities are involved in a twofold network of social relationships and cooperation rules: those based on kinship (the solidary group) which can also be metalocal ones. These constitute the social dimension of the "pastoral community" but at the same time, and in a decisive way, they are part of the integration which derives from the primary relationships experienced in the place. With regard to the latter (the ones that provisionally and generically we define as "modern villages"), they still maintain peculiar traits as against the "market area" of the agricultural sector, even though in different ways and to

different extents - at times significant ones - a general process of transition from integration based on kinship and local relationships to one based on the national community, is in progress.

By the "market area" of agriculture we refer to the heterogeneous whole of productive units which carry out a series of relationships based on the sharing of the space occupied with other economic and social subjects, and yet, as predominantly oriented towards commodity production and/or the agricultural labour market, are in fact placed in a dimension beyond locality and kinship such as that of the institutions of the modern sector of production (both immediately economic and administrative and legal ones).

As already mentioned, the new forms of social aggregation, the spreading of basic public services, the building up of administrative networks, the enlargement and intensification of communications, as well as the policy of public intervention in the economic sphere and the widening of the "market area", have limited the weight of the "economic and social blocs" chiefly involved in self-consumption, both from a political and a psychological point of view.

These processes have created a new, ever more relevant social reality made up of the 'combination-units' of the various productive sectors, of the whole of the interests of the various social groups of the country - no matter how dis-homogeneous and at times antagonistic they may be.

In short, similarly to what has already been said about herding, the peasant communities are progressively becoming one of the various components of a larger economic, social and political entity, even though this is often barely detectable, they are beginning to lose their traditional autonomy both on the economic and the overall cultural levels.

The "market area"

We shall now consider briefly the characteristics of what we have defined above as the "market area". It is made up of the whole of the productive units to which relationship with the market is essential. A basic character of the 'third compartment' of Somali agriculture is the fact that the various farming concerns are widely different. This diversity can be immediately identified by referring to the type of commercial exchange that is being realized. Furthermore, this aspect permits us to present the main types of farming concerns and their correspondent social figures:

1. Productive units which entertain relationships with the market only with regard to the selling of all or most of their output. This is the main characteristic of the market-oriented peasant area (as different from the one mainly involved in self-consumption). The fact that instrumental goods are not bought (or are so to a negligible extent only) suggests the economically most backward stratum - one which can be defined as 'poor market-oriented peasant' stratum.
2. Units which sell the most (at least) of their products and buy a considerable part of the instrumental goods utilized (seeds, fertilizers, motor power, etc.). These are the economically most advanced peasant units and the cooperatives.
3. Units which produce agricultural goods only, draw almost all the instrumental goods utilized from the market and also buy all or most labour on the market. This is the area of wage-earning labour and of the corresponding social figures: the entrepreneur and the agricultural worker.
4. Sale on the peasant's part (he is often the producer of subsistence goods) of his own labour power. These are the units which are referred to in the literature as

peasant-wage earning ones.

As can be seen from this summary outline, this 'compartment' of agriculture is made up of very different productive units and within those one can detect the whole range of social figures which make up the agriculture of the more advanced countries. It is clear, however, that, both for the novelty of the historical-economic process underlying it and for socio-political peculiarities of the country, each social category maintains its own traits which make them different from those of the European countries.

In fact, all the units presented above are being affected by deep processes of change and are, to a large extent, the result of the economic and political dynamics of the last years. Thus, the sector generically identified as "peasant commercial" is practically only a few decades old.

Colonial agriculture knew only two types of farming concerns, side by side but clearly separated from herding and from the peasant community. Two types clearly distinct one from the other and mutually complementary: the plantation and the many adjoining 'small farms' run by the wage-earning labourers employed by the large farms. Later, both the decrease of foreign investments in agriculture, public interventions limiting concentration of land ownership and the deep crisis of the banana production, have made for a decrease of the weight of the wage-earners' area and have markedly reduced the average economic dimension of this types of farms. At the same time, this process led to a decrease of the demand for agricultural labour, hence to the expansion of the peasant (commercial and/or self-subsistence) character of former wage-earning peasants. New types of farms, such as state ones and cooperatives, have also expanded.

In the present state of available information, we cannot make a reliable assessment of the economic and social weight

of the various 'compartments' of agriculture or, even less, of the weight of the various types of productive units in the "market area". Not even an estimate of the ratio of the population employed in the sector living on subsistence agriculture or of its output can be attempted.

It seems sufficiently certain, however, that in the last decades, and perhaps even more in the last years, residential agriculture has progressively increased as against the large sector of herding. Just making a comparison with the southern and central areas of the country (owing to available statistical information), we see that herdsmen (and herdsmen-cultivators) increased from 897.000 to 1.320.000 from 1953 to 1977; but the increase of residential agriculture is much more relevant as the employed population more than doubles: from 240.000 to 587.000. More in general, there has been a concentration of agriculture in the "Mesopotamic" area characterized both by a residential and a market-oriented social structure. Public interventions, however, have limited the intrinsic trend of the market-oriented agricultural production, both checking concentration of the private means of production, and promoting the development of a public and cooperative sector.

Here we can only submit an assessment of the modifications that have characterized the three compartments in the last few years:

1. Herding in a strict sense (i.e. breeding without the shepherd's residence): tendential, even though contained, decrease of the employed people.
2. Agriculture and zootechnical agriculture predominantly aimed at production of subsistence goods and with permanent residence: exit of part of the employed people, partially compensated for by entrance of former herdsmen.
3. Productive units having a predominant relationship with the market:

- shrinkage of peasant-wage earning productive units and their transformation into peasant units (both market-oriented and subsistence ones);
 - shrinkage of the capitalistic sector and of agricultural labourers;
 - tendential increase of the peasant market-oriented sector, even though limited to a few particularly favoured areas both in terms of irrigation possibilities and of their capacity of supplying the urban market with valuable food-stuffs.
4. Expansion of the cooperative and state area.

FOOTNOTES

Note: This paper summarizes the results of two periods of time spent as a visiting professor at the Faculty of Economics of the Somali National University. The argument is presented in an extremely reductive way - it is "desperately short", to use Schumpeter's words. The paper does not account for all the changes that have occurred nor does it present all the surveys carried out. It only aims at pointing out the basic variations directly and decisively related to the issues under consideration. Due to space limitations and for the reader's convenience, statistical references are kept to a minimum in the text and are to be found in the footnotes.

^I In 1975 the population employed in the primary sector amounted to 3/4 of the whole population (75.6%)
As reliable estimates of the large sector of production for self-consumption are lacking, no quantitative indications can be given as to the relevance of resources

coming from agriculture. The importance of agriculture, however, is fully demonstrated by the following information:

- people employed in the industrial sector are about 12.000 out of a total population of 5 millions; also, almost all local industries work raw materials coming from agriculture: cotton, sugar, hides, meat, etc.;
- over 96% of the total value of the goods exported by Somalia in 1978 came from the primary sector.
(cf. Central Statistical Department - State Planning Commission: Somalia in figures, September 1973)

² Until the 1960s the yearly increase rates of Somali population were about, if not below, 2%. They were, thus, considerably lower than those of most underdeveloped countries (in 1960 in most Latin American countries these rates were higher than 4%). In recent years the population growth has accelerated noticeably: from 2.56% in 1970-1974 to 2.83% in 1975-1979. (cf. State Planning Commission: Special Statistical Issue, October 1979)
It is clear, however, that the real problem of the increase of the Somali population, which is a veritably dramatic one, is related to the massive influx of refugees caused by the latest war events. Several thousand refugees have entered the country and an increase of the population from the present day 5 millions to 6 millions can be forecasted for 1984.

³ As already said in (I), industrial employment is still very limited. On the other hand, employment in public administration and service sector, and even more urban unemployment and underemployment, have massively grown.
(cf. State Planning Commission: Special Statistical Issue for the Tenth Anniversary of the 21st October Revolution, October 1979)

- ⁴ In 1979 the Mogadishu population was 515.000 as against 60.000 in 1953. In 1975 the population of the centers with over 10.000 inhabitants was 1.068.000. (cf. WHO/IBRD: Water Supply and Sewerage Sector Study)
- ⁵ Animal power for agricultural works is practically non-existent; mechanical power, on the other hand, is basically used only in the capitalistic sector (banana industry) and in state industries. It thus affects a minimal part of all tillable land (certainly less than 10%). Utilization of farm tractors supplied by public organizations is also extremely limited.
- ⁶ There is no precise statistical information in this regard. However, the increase of the population of the larger urban centers and intensification of emigration abroad are a clear demonstration of the exodus from agriculture.
- ⁷ The average output per ha of Somalia and Europe in 1977 and 1978 was as follows:

	Somalia	Europe
maize	5.6	57.2
rice	3.0	30.1
wheat	4.0	38.2

source: Statistiche Generali della Comunita, 1979; and
FAO, Production Yearbook 1978

- ⁸ In Europe at the beginning of the 1960s self-supplying existed only for butter; now there is a surplus of all great productions with the only exception of maize and rice. Somalia is very deficient in all respects and the situation is worsening as appears from the table below:

Percentage of Somali production out of total consumption

	1969-1971	1976-1978
rice	0	10.8
maize	91.8	71.1 (1975-77)
broomcorn	96.7	96.6 (1974-76)
sugar	99.9	38.4

source: FAO, Production Yearbook 1978

- ⁹ With regard to the second case indicated, one should think of most of the reports of international experts and of the sector surveys carried out in the last decades; these surveys are very often directly linked to specific productive interests and/or export activities.
- With regard to available analyses of Somali agriculture, at least two of the most proficient contributions should be mentioned. They are both works that, though superseded in part by the latest developments of the country's economy, deserve the greatest attention. There is, first of all the already mentioned book by I. M. Lewis, *A Pastoral Democracy*, which, though limited to the northern area of the country, carries out a detailed analysis of the social relationships and culture of pastoral society. In a more directly economic line, we should mention G. Querini, *Agricoltura e sviluppo economico: il caso della Somalia*, a book which is rich both in theoretical depth and in the empirical information utilized. As an appendix, it presents an exhaustive bibliography on Somali agriculture.
- ¹⁰ A clever and synthetic analysis of 'tributary societies' can be found in Samir Amin, *Unequal Development*.
- ¹¹ In the last years the organizational structure has become more reactive to variations in the prices of the goods produced. See below.

- I² So far the new forms of breeding promoted by public authorities have been rather scanty. Given the social relevance of the problem of milk supply to the city of Mogadishu, important interventions towards a reduction of milk production cost can be forecasted in the next future, along with new forms of breeding. Milk production costs are at present very high. We should mention the project for a semi-stabled breeding (to be carried out in the near future) in the Afgoy district.
- I³ The figure regarding the period before independence refers to the former Italian area only.
From a survey of 1953 there appeared that the nomadic population made up 75% of the whole population. Considering that herding had (and still has) a greater weight in former British Somalia, its overall weight on the global territory can probably be estimated around 80% in 1960.
The latest census shows that the nomadic population was 59% of the whole population. (cf. Three-Year Plan 1979 - 1981)
- I⁴ In the very last years emigration abroad has considerably increased. It appears from estimates that migrants are presently over 250.000, mainly employed in Saudi Arabia and the Gulf States. It is a very large group, ten times higher than the total population employed in the Somali industry. Furthermore, as migrants' average wages are 6 - 10 times higher than domestic workers' wages, it can be estimated that their remittances are about 30 times the overall income of the workers employed in industry.
- I⁵ See Mohamed Kalif: Caratteri generali, strutture e problemi dell' agricoltura somala, to be published in: Rivista della Facolta di Agraria of the Somali National University.

"In recent years, owing to the preference of foreign and domestic consumption, breeding of dromedaries and goats is changing into breeding of cows and sheep. Cows and sheep need more water than dromedaries and goats do; they concentrate therefore, in the areas near the wells, thus limiting available pastures for nomadic herding during the drought period."

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Diana B. Putman

AGRO-PASTORAL PRODUCTION STRATEGIES AND DEVELOPMENT
IN THE BAY REGION

Introduction

By presenting preliminary findings from an on-going ethnographic investigation of household structure, domestic economy and resource allocation among agro-pastoralists in the Bay Region of Somalia, this paper proposes to show how theoretical and practical concerns can merge while doing development related research. For a number of years there has been controversy within anthropology over the relative merits of scholarly versus applied research and until recently applied anthropologists have been perceived as second-class citizens by many of their academic colleagues. When teaching positions were readily available, academic tenure was regularly awarded and large research grants fairly easy to obtain, most trained anthropologists quite naturally usually joined the academic community. Moreover, a basic tenet of the discipline was that anthropologists observed cultures where they did research and minimally disrupted them.

Changing economic conditions and a changing vision of the potential uses of their theoretical and methodological training has created a new breed of anthropologists.

These individuals feel that a more active role for anthropology is possible so they are taking jobs as managers of social welfare projects, becoming involved with policy making at various levels and doing applied research for programs of planned social change. As a result, traditional anthropological methods have been adopted to these novel work situations and methods have also been borrowed from other disciplines. Furthermore, despite the fears of traditional scholars that

in their haste to practice anthropology, the new anthropologists would neglect theoretical concerns, it appears that application is not antithetical to theory building and may even spur it to greater levels of sophistication.

The initial research on which this paper is based was undertaken as a preliminary socio-economic study for the Bay Region Agricultural Development Project. During this phase, important practical and theoretical issues which required further research became apparent. Consequently a study was designed with the dual purpose of contributing to our theoretical knowledge of African production systems while also answering pressing questions being asked by developers. I will describe first background on current and past development activities in the Bay Region, then present the initial data gathered which provoked several hypotheses which I am in the process of testing. Further investigation will be required to extend the findings discussed here.

Development activities

Since Independence in 1960, development activities in the Bay Region have been scattered and intermittent. The focus has generally been on agricultural intensification through various approaches including cooperation, extension activities and individual farmer training. There has been a shift from an initial promotion of the use of draft animals to mechanization and tractor use and back again to draft animals. In the early 1960s, the Bonka Farmers Training Center and Research Station was built and staffed, mainly by Americans who relied on traditional extension techniques to try to improve the yield of small producers. The 1970s ushered in a new political scene bringing with it an approach to increased production through the establishment of large scale mechanized state farms and cooperatives which individual farmers were

encouraged to join. Otherwise, little attention was paid to the problems of small scale producers. At the end of the decade, another shift in political climate and a growing realization that production did not seem to be increasing, brought renewed interest in the small scale farmer, who was again viewed as the country's hope for achieving food self-sufficiency. As before, the panacea is seen to be promoting modern methods through the use of extension agents posted to rural areas.

While these varying efforts in the cropping sector failed to produce any significant results, even less of an attempt has been made to modernize the livestock sector. Veterinary services have been only sporadically provided, some water catchment ponds (war) and stock wells have been dug, but have been poorly maintained and a few restricted grazing areas have been set up in the region. Livestock have by and large been left to follow their traditional production techniques. Thus, twenty years of development efforts in the Bay Region can be characterized as largely unsuccessful.

There are several reasons to which the failure of these efforts can be attributed. A big problem has been the lack of a clear cut and sustained policy for promoting production as a result of national policy makers changing strategies several times within the last two decades. An even bigger problem, however, is the fact that to date, no integrated technical package to improve crop yields appropriate for the region's conditions has been developed. This problem has been cited by a number of researchers (Schmidt 1981; Nissly and Martin 1982) and it is clear that until an appropriate package is chosen, greatly increased crop yields are unlikely.

A third major problem is the incorrect ways in which Bay region producers have been characterized in various development documents. Producers have been described as either primarily sedentary farmers with minimal involvement with live-

stock or nomadic herders. There are also supposed to be a few semi-sedentary farmers who do some herding (IBRD/FAO 1977; IBRD 1979; USAID 1980). These typologies which try to rigidly dichotomize between farmers and herders fail to grasp the complex and variable production strategies which have been developed by individuals living in this region (Hunting 1982; Putman 1982; Boston University 1983). As a result, interventions frequently are inappropriately designed to meet the needs of the recipient population (USAID 1979; USAID 1980).

Current projects

There are two agriculturally oriented projects operating in the Bay Region: the Bay Region Agricultural Development Project (BRADP) and the Agricultural Delivery Systems Project (AFMET). While efforts are underway to revamp the structure of these projects, their basic design does not take into account the problems mentioned above which include the lack of a technical package and incorrect characterization of producers. AFMET's (USAID OII2) goals among others are to train and place agricultural extension agents in rural areas in order to teach farmers more modern production techniques. Although agents are being trained and assigned to villages, at the present time, their usefulness is debatable in light of the lack of a cohesive package which they can extend. Furthermore, their training is generally biased towards crop production which raises the issue of how effectively they will be able to promote the integration of crops and livestock in their management schemes.

BRADP has two main objectives:

- "1) to increase crop and livestock production in the region by increasing production on currently cultivated land and expanding cultivation into new lands, and 2) integrate extension operations to incorporate both crop and livestock interventions in a farm systems approach." (USAID 1980:2)

Although BRADP does have a research component built in, there does seem to be an assumption that the indigenous farming system is much better understood than appears to be the case. Furthermore, the livestock component consists primarily of providing veterinary assistance with little or no promotion of modern livestock production techniques, which is probably wise to our lack of understanding of the present system. Experimentation with integrating livestock and crops was to be done through four Pilot Agricultural Development Units, a plan whereby some 75,000 hectares of land in four different land use zones would be aside and the populations living there introduced to new farm management practices. Several reports (Hunting 1982; PIU 1982) have suggested, for various reasons, that this approach is unfeasible so alternative strategies to accomplish this goal are currently being reviewed.

Despite the fact that projects have been designed without an adequate understanding of local production systems, funding was included in BRADP for some basic socio-economic research to be undertaken. As a result, I was hired on a three-month contract to do a literature search on the Bay Region, conduct some preliminary fieldwork and make suggestions for future research to be undertaken by a long term team to fill some of the most critical data gaps. The University of Wyoming is fielding this team of social scientists to spend several months in the Bay Region doing a socio-economic survey which will cover various land use areas.

Ethnographic background

As expected, my literature search, undertaken both in the United States and Somalia, revealed that very little had been written about the Bay Region. The development documents available are generally written by economists, livestock specialists, agronomists, hydrogeologists, engineers and

other technicians and are usually based on no more than a few days or at most two weeks fieldwork in the Bay Region. Only a very general and often faulty picture of local production systems can be gleaned from these sources. Some very general surveys have been undertaken as reported in the IBRD/FAO (1977) report, but much of the data is questionable. Ethnographic information is provided by one article and one development report (Lewis 1968, 1969).

Lewis' writings are instructive because they examine the distinctions in social and political structure between the southern cultivating Somali and their northern pastoral neighbours. He argues that these differences are attributable to the contrasting economic and historical circumstances of these two groups. Lewis' work focuses on particular southern structural features which are largely absent in the north such as

"the formation of large stable politico-legal groups in the south; the associated development of a hierarchical, though far from strongly centralized, authority systems; and the widespread adoption of foreign clients in group formation." (Lewis 1969:59)

He uses an ecological framework to show that the exigencies of settled farming require different organizational forms than nomadic herding. In his chapter provided to Lockwood Surveys' Agricultural and Water Surveys of Somalia (1968),

Lewis describes in some detail southern social structure and traditional land tenure conditions.

My research is intended to complement Lewis' by looking at the relationship between social structure and production decision-making at the household level among agro-pastoralists in the Bay Region. In contrast to Lewis, I am most interested in the economies of alternative investment strategies in agriculture and livestock herding and how the labor requirements of different activities are met through the social structure. Thus, gathering social structural and economic data from a sample of households has been my primary research goal although I am still in the early phases of my investigation.

The Bay Region populations

The Bay Region has a human population of approximately 420,000 people (Hunting 1982) and a regional area variously estimated at between 2,500,000 and 4,000,000 hectares of land of which 15-65% is considered to be arable (Putman 1982). This region is considered to have the greatest potential in Somalia for intensification and expansion of agriculture (USAID 1980), while at the same time holding the highest number of livestock of any region in the country (Hunting 1982). Projecting for 1980 from 1975 census figures provided in the BRADP Paper (1980), a Boston University team's (1983) report divides the Bay Region population into three groups:

- Non-agricultural (mainly wage earners and townpersons): 20%
- Settled farmers (including semi-nomads): 45%
- Pure nomads (most of whom live in the region): 33%

(Boston University 1983:V.4). This report goes on to say that

"this official classification of households by settlement type is misleading, for it masks the fact that households of two or three types are often grouped together in larger extended management units." (Boston University 1983:V.5)

There are indications that contrary to Lewis' remark that

"where people of these groups (Digil and Rahanweyn) do practice pastoralism it is ancillary to their fundamental concern with cultivation." (Lewis 1969:61)

Indeed, informants have stated that to be rich a man need only farm, but to have a name must have animals and this refers specifically to camels.

Some contextual background derived from my regionwide fieldwork (Putman 1982) and from some of Lewis' writings (Lewis 1961; 1982; 1968; 1969) will be provided while details come from initial findings from the buulo where I have settled to do intensive fieldwork. This buulo is located approximately thirty kilometers northwest of Baidoa.

Northern pastoral Somali have been moving south since at least

the twelfth century when they either displaced or assimilated with Galla and Bantu populations (Lewis (1961)1982: 24-25). This contact influenced their social organization and from the latter came the adoption of cultivation. Although today all the people in a settlement may identify themselves as being Rahanweyn, social distinctions based on where their ancestors came from continue to be relevant and may influence choice of marriage partner and access to natural resources. According to Lewis (1969:61-63), lineages were the foci of social and political identity and of heritable rights of land and water, yet they seldom appeared as distinct territorial divisions within a clan and typically villages contained men of several different lineages, therefore, being heterogeneous in agnatic composition. At one level, village affairs were organized by elders of lineage segments living together, yet land ownership was in the hands of the clan. The clan had a permanent administrative organization paralleling its internal segmentation and segment leaders exercised informal judicial and political functions. Today, however, with government abolition of land ownership and the imposition of a national political structure onto the indigenous system, changes have been occurring in how local decisions over resource allocation and politics operate (Putman 1982). The smallest residential unit in the Bay Region is the hamlet or sub-village (buulo) containing up to forty or fifty houses divided into compounds containing agnatically related men and their families. For administrative purposes, hamlets (5-20) are attached to villages (tuulo) which are the smallest unit recognized by the national government. Villages (3-6) in turn are aggregated politically into zones (beel) which are divided between the four districts (degmada) which form the Bay Region. At the hamlet, village and zone levels there are committees, whose members are elected, which manage resources fairly autonomously, although members

at the zone and sometimes village levels are expected to belong to the only national party XHKS (Putman 1982).

Land Tenure

Technically, the Ministry of Agriculture determines the allocation of land today. In reality, someone who wants land to cultivate goes first to the hamlet or village committees to get such permission. Government officials emphatically deny that any land is sold; according to law it can only be leased. While this may be the legal status, informants during my regionwide survey indicated that land transactions where money or livestock exchange hands are not that unusual. In some cases an individual who needs cash to emigrate to the Gulf States or perhaps to move to Baidoa will sell some land to a neighbor in the village, or a man who chooses to live near his wife's relatives may decide to buy land near her natal village. The cases which I have documented, however, all occurred several years ago and it is unclear whether land is still being sold in rural areas. There have been some reports which indicate that although land prices remain low they have doubled and tripled in recent years, and there are cases of outsiders coming in and buying land (Boston University 1983). Most land is controlled by men; however, some women, especially widows control their own farms. Female inheritance of land has been allowed for at least two generations, especially if there are no male heirs. Present Somali law requires that daughters inherit equally with sons, although this does not always occur. Where women have their own farms they can generally dispose of the harvest as they wish. Since there has never been an agricultural census, data on farm size and crop areas are often based on vague estimates. Hogan et al. (1981:40) suggest that the average married man has cultivating rights on one to three hectares with more prosperous farmers cultivating up to thirty hectares. IBRD

(I979:8) states that the average family owns between seven to eight hectares but only cultivates about five hectares annually. Initial questioning of informants suggest that the average holdings are in the three to ten hectare range. This has been borne out by the few fields measured. It is difficult to get accurate data on farm size because informants do not always reveal that they have more than one field. The largest single plot measured was seven and a quarter hectares, but the owner of this plot indicated the total of all their fields would give some local farmers larger farms than his. Boundaries between fields are demarcated by trees, bushes, rocks and aloe plants. Disputes over boundaries or trespassing are settled by the buulo committee.

Today, all land officially belongs to the state, but individuals are allowed to take out fifty year leases and are given Certificates of Registration to prove it. Once land has been registered it can be passed to one's heirs so there is a definite advantage in complying with the law which requires registration. Nevertheless, any quantification of the number of hectares registered in the Bay Region runs into considerable difficulties because the records kept at the Ministry of Agriculture locally in Baidoa and nationally in Mogadishu are in complete disarray. Estimates of the number of hectares registered vary from 3065 to 7100 which seems quite low if between 132,000 to 450,000 hectares are currently under cultivation (Putman 1982). Moreover, the fact that many informants state that they have registered land may only be a function of the fact that this has been mandatory since 1979.

Very little data is available concerning the control of dry and wet season pastures. Traditionally, pasture land was controlled by clan segments as was arable land, but, other than to suggest that unregistered land can be used by everyone, the modern political apparatus does not seem to have become very involved in the allocation of pasture rights. Nor are there

more than a few reserved grazing areas in the entire region. The problem of squatters enclosing good pasture and refusing access to others which is evident in the north does not seem to be common here. (Putman 1980a)

Water resources

Water resources are as, or more, valuable than land in the region and lack of water may be the greatest constraint to development. Water has both traditional and modern systems of control operating side by side. There is, unfortunately, little concern among planners over how this conflicts. Hand-dug or machine-dug rain water catchment ponds are known as war (pl. waro) and are generally community property, although a few are in private hands and may generate quite a profit to their owners when the water is sold. The management of community waro is in the hands of the guddiga warta which is an elected committee ranging in size from three to twenty people. These water managers are known as sagaale and they are responsible for determining amounts of water allocated to buulo members and guests, guarding the war themselves or assigning guards, rules of use and their enforcement, fees to be charged if any, and maintenance work to be done on the war by families in the buulo. There is a headman called warta aawjeey (in Afmaymay) which means father of the war. Initially, he is the owner of the land where the war is dug. If he does not do his job properly, however, the villagers will replace him with an elected person. The aaw has one or two deputies (gob) whom he chooses himself. The terms yogor and fatiir are used to describe the villagers who use the war and help to maintain it. The aaw and gob generally are men as are the sagaale, though in recent years where there has been sufficient pressure from the government, women have held these positions. When work is performed on the war men usually do the digging and women haul the dirt away. Further details about the organization and use

of waro is available in Putman (1982) and Roark (1982). Unlike the waro, water sources which have been provided by donor agencies or the national government seem to remain outside of community control such as government wells and waro provided by the European Economic Community and controlled by the National Range Agency. Fees are usually charged for the use of government water. Details will not be provided here, but suffice to say, that where fees are charged and control is out of local hands, these water sources are only used when no other water is available. Furthermore, it augurs poorly for the success of current efforts to provide new wells (USAID OI04) which are likely to be perceived as outside of local ownership and control. According to evidence available, maintenance will surely be a problem if efforts are not strengthened to keep the local population involved.

Agro-Pastoralism

The Bay Region rural population is divided mainly between agro-pastoralists and pastoralists with a minority of people who engage solely in agriculture or charcoal production (Putman 1982). The most common pattern is for a household to divide its labor between the cultivation of dryland sorghum (and some legumes) using simple techniques and the herding of various species mixes of ruminants (sheep, goats, cattle and camels). My preliminary work (1982) indicates that the agro-pastoral production option can be viewed as a continuum with many points between virtual pure farming and pure herding. I believe that not only can households in general be described as functioning at various points along this continuum, but also that individual households themselves move along a similar continuum depending upon where they are in the domestic cycle and the availability of family labor. I anticipate that differential access to resources such as land, water, livestock and extra-domestic labor will affect a household's

production strategies as well, but until the structure of the production unit is defined it is difficult to account for the importance of any of these variables. Thus, it is expected that the developmental stages through which the domestic unit passes and changing modes of labor allocation will play an important role in economic decision-making. My present investigation will define the range of alternative production strategies available to households in a Bay Region community. Specific ecological, economic and socio-cultural factors which influence a household's choice among these alternatives will be identified. My first month in the hamlet has been spent in general participant-observation and conducting a census in order to determine relevant household units from which to choose a sample for detailed investigation. Difficulties encountered while conducting the census provide some idea on the general mobility of the population.

Buulo Composition

When I arrived in the hamlet on May 10, 1983, there were twenty-three permanent buildings (muddule or cariish/barako) and seven temporary buildings (agal soomaali) standing. They are not all homes, however, because this includes a metal roofed cariish (known as a barako here) which is supposed to be a school but is being used as an Agricultural Development Corporation warehouse, three non-functioning teashops (which may open up at harvest time), a general store and some privately owned storage facilities. At first it appeared that every household owned at least one muddule, but further investigation showed this to be untrue because some households have no permanent residence in the hamlet, some own more than one building and others share the same building when they are in the hamlet or a building has multiple uses. Furthermore, it was discovered that some households have muddule and farms in more than one hamlet. Local political

leaders may insist that such an individual belongs to the hamlet although he may spend much of the year elsewhere.

Another complicating factor is those households whose permanent residence is clearly in another hamlet, but who are involved in the daily economic life of this hamlet, and who spend part of the year camped outside this hamlet in the company of regular residents while herding livestock. There are isolated houses located a few hundred meters away from which conflicting reports of which hamlet they belong to are given. A final problem is those households that have no permanent residence anywhere, but move their agal soomaali between fields in different locations and grazing areas. Moreover, some way to categorize those individuals who own farms in the hamlet but live elsewhere permanently must be found. The difficulties encountered while trying to conduct the census are instructive for several reasons. It is apparent that a variety of income-earning strategies are being pursued by local inhabitants which involve various amounts of mobility. Of greater significance for development efforts is the difficulty of assigning a precise home location to many residents, or coping with the reality of the dual residence status of people who usually would be categorized as settled farmers.

Household Composition

If determining who actually belongs to the hamlet has been difficult, assigning people to different households has been even more problematic. Some households are quite straightforward to identify: a man with his wife or wives and their children who form one economic unit, albeit dispersed in space for much of the year. But where to assign the middle-aged woman F. who has her own muddule, is married but has not seen her husband for several years, and who does some work on her son G.'s farm. She eats with G.'s family when

G.'s wife is located nearby with the livestock, but the rest of the time eats with a household where the male head C. is a maternal cousin. There is a further economic connection between the households. G. herds his and C.'s camels together for no compensation, but stays at C.'s house and eats with him when his wife is not present since he does not own a muddule. Yet G. and C. have separate farms where they work, and in G.'s case, his mother assists and paid laborers are used in both places, and their respective children herd the small ruminants. Furthermore, they store their sorghum separately and the wives of these two men do not cook together even when they are located near one another. Further details will be required to ascertain the extent of the economic connections between these two households and whether the mother F. should be assigned to her own household or should be placed in her son's household. Presumably C.'s old mother I., who is in her 80s, should be considered a member of his household since he provides food for her, yet she does all her own cooking, lives in her own muddule, owns livestock and even has a tiny sorghum plot of her own.

With all these caveats in mind about determining how many residents and households belong to the hamlet the following tentative figures are offered. There are 69 residents in the hamlet.^I Of these, there are eleven male household heads; six with one wife, four with two wives, and one with three wives. There are four female household heads, so designated because they are either widows or their husbands have been absent a long time and they seem fairly economically self-sufficient (two other women who live alone have been classified with their son's households because they appear to be economically dependent on them). There are fourteen men in the village, twenty-three women (two wives live elsewhere and are not counted), six teens (half male, half female ages 12-16), and twenty-six children (fourteen

boys and twelve girls). There are at least thirteen other men who have farms within the hamlet's territory and perhaps more. Seven of them have no other farms while the rest have farms as well in other areas and commute to get the agricultural work done.

Production Strategies

One thorny question is whether a man's several wives and their children should be classified as one household or as separate households. If they are classified as separate households then the problem arises of where to place the husband. At this stage of my research I propose to group polygynous family units as one large household because despite variations in unit organization they form one economic entity. If the household unit farms and also herds livestock the following general pattern usually prevails. When a man has only one wife he remains on the farm for much of the cultivating season attending to the crops while his wife and younger children care for the sheep, goats and cattle and older sons (or relatives or friends) herd the camels if he owns any. When a man has two wives, the women alternate on an annual basis between farming and herding chores while the man continues farming. In either case, the man may occasionally take his camels on the long transhumance in the dry seasons to the riverine zones if his sons are too young to do so. When a third wife is present, the wives continue to take turns doing the herding with two remaining on the farm at any one time. All the women who have been asked so far say they prefer herding to farming because it is less work and does not hurt the body as much. The livestock herded may belong to the husband or to the co-wives who do take care of each other's stock at least sometimes.

Different strategies are followed in order to use co-wives' labor in farming. A man may have one big field on

which he and the resident wife (wives) work. He may have two or more fields in which case he may assign a field to each wife, and he himself alternates fields, working on the one assigned to the absent wife. The wives themselves may own fields in which case they may work only on their private field or alternate between their own and their husband's fields.

Storage and cooking patterns are not uniform, but the evidence still points to one interrelated economic unit. Thus, if a man has only one field he may store all the grain together in one underground silage pit or he may divide it into separate pits so that each wife has access to and control over her own pit. If he has several fields he may again store all the harvest in one pit or have separate pits for each field and for each wife. When the herding and farming units are located twenty to fifty kilometers apart the wives cook separately. But, when co-wives are located in the same hamlet at the same time or one is camped nearby, their decision on whether to cook together and share other household tasks seems to depend on their personal relationship. Of great interest is the surprising number of men who pound grain and cook for themselves when their wives are absent rather than depending on other village women. Nevertheless, despite the autonomy of daily production activities as quoted by the Boston University report (1982) below, the polygynous household can be characterized as one economic unit.

Boston University's recent report (1983:V.5) states that

"this official classification of households by settlement type is misleading, for it masks the fact that households of two or three types are often grouped together in extended family management units. The individual households, under the management of closely related kinsmen, enjoy considerable autonomy in day-to-day affairs but constitute a single extended family unit in regard to the allocation of resources and the pooling of risk."

I propose to mention briefly a case example which illustrates this statement. In the following case, there are two distinct households which form one economic unit. MK. is a man in his thirties with a wife and three small children. He is both the paternal nephew and stepson of SM. (for MK.'s mother married her first husband's brother SM. when she was widowed by MK.'s father). SM. is an older man (early sixties) who has been a widower three times and has recently remarried a younger woman. Only two out of seven of his children survive - a twenty year old son X. who is responsible for herding the camels and a seven year old daughter who lives with her dead mother's sister.

The economic strategy described to me in early June is as follows: MK. lives in our hamlet in a muddule owned by SM. SM. spends most of his time, except for a few visits during the farming season, in a village some fifty kilometers away where he has had a koranic school for the last six years and owns a muddule there. MK. is in charge, on a daily basis, of the two fields they share, one inherited, the other purchased from another villager in 1971. He works on the farm regularly and occasionally hires day laborers but SM. could not provide details on the costs of these workers. SM. comes to the village only to help plant, weed and harvest. He provides extra labor for the farms when he comes by bringing a dozen or so koranic students along to work whom he feeds but does not pay. He plans to bring them a total of five times in Gu 1983 season to plant and weed, but will not bring them to harvest this year since the crop is not expected to be too plentiful due to dry conditions. The harvesting will be done by MK. and SM. and their respective wives. Meanwhile MK.'s wife and children herd the sheep, goats and cattle. When asked to whom the livestock belong, SM. states that they all belong to him, but that which is his also belongs to MK. MK., when asked, agrees. The men own

two sorghum pits, but they both eat out of the same one and when it is finished switch over to the other pit.

Of his three income-earning activities, SM. stated that farming is the most important because it provides sorghum to eat and which can be sold to buy clothes and other goods. Teaching is second because it provided the income with which to purchase the livestock. Yet, SM. spends the most amount of time teaching, minimal time farming and probably no time herding. Further investigation will be required to reveal the details of the economic interdependence between MK.'s and SM.'s households.

The climatic calendar determines the rhythm of people's activities. There are four recognized seasons:

- Gu (spring rains, April to June) the main cultivating season;
- Hagaa (dry summer, July to September) harvesting is done late in this season;
- Dayr (autumn rains, October to December) cultivation is attempted but frequently fails;
- Jiilaal (hot and very dry winter, January to March) following the harvest livestock consume crop residues, many water reserves become dry resulting in much movement of people and livestock.

Production activities vary from season to season as does the allocation of family labor to various tasks. Movement of people and livestock varies from year to year depending on quantity and timing of rainfall, presence of insects and soil conditions.

When we arrived in the hamlet in early May it was fairly deserted. Only middle aged men, some old women and a couple of wives were present. Most of the women, children, teens, and a few men had left forty-five or so days previously when the first rains came (about March 25th) to take the livestock to a grazing area, Geede, some twenty to forty

kilometers north and northwest of the hamlet near the border with Bakool Region. The women take their agal soomaali and a supply of sorghum and set up home for several weeks, moving as the pasture runs out. The children and teenaged girls herd the sheep and goats with some supervision from their mothers, while the cattle are left unattended during the day to graze but spend the night around the camps. The camels are herded by the teenaged boys and the men either in the vicinity of the camps or farther away. The men left in the hamlet to do the farming often visit their wives and children on the weekends.

Back at the hamlet the first sorghum was sown about April 20th along with corn, mung beans and peanuts. Due to scarce rains this spring the peanuts did not emerge, nor did much of the corn or mung beans. Even the sorghum stands are sparse despite repeat sowing by farmers during the first two weeks of May. The first weeding is begun even while people are still sowing and has continued daily through our stay. The farming chores are performed by both men and women individually or by two or three family members working in the fields together. The traditional collective agricultural work group known as barbaar (Lewis 1969; Putman 1982) does exist in the hamlet. Both men and women may belong to the group which may be called upon to work in other hamlets as well. Work is performed only during years of good rain so it has not worked in Gu 1983. When the barbaar goes to someone's fields the owner does not have to pay the members, but just provide a meal. On several occasions this season farmers called on other men to spend the day helping them to weed for which they were fed, but this is done on a voluntary basis and not mandatory as are barbaar obligations.

A surprising finding in my hamlet, somewhat contrary to information given in the region-wide survey, was the number of people who worked as day laborers on each other's farms. The

fee for weeding is 5 - 12 SoSh² per tacab depending on how overgrown the field is. One tacab is 30 paces by 3 paces or approximately 3.5 by 40 meters. People generally work four to six hours in the morning when hired and can weed up to one tacab per hour if the field is not too overgrown. In the old days people would accept sorghum in payment for their labor, but today most people prefer cash. People hiring themselves out do not necessarily appear to be poorer individuals, but may sometimes be better farmers whose own fields are already weeded, though monetary need is also the incentive in some cases. Sometimes a farmer has been known to pay his brother or other relatives for working in his field.

The last week of May we observed many of the women and children moving back to the vicinity of the hamlet with the cattle, sheep and goats despite the earlier assertion by people that they would not return until closer to the harvest in late July / early August. One reason may be the scanty rainfall this season which means the grazing areas were finished more quickly than usual and the clay soils around the village dried up sooner than expected so that the livestock could be brought back to the area. The returning people have set up camp about one kilometer away from the hamlet in a pasture area. The camels will continue to stay away until harvest time at which point they may be brought back to the hamlet area. Or, if the browse runs out soon, men will move the camels out in different directions where they will remain until the beginnings of the Dayr rains when the men may return to the farm and bring the camels back to their present grazing areas north of the hamlet.

I have not yet received many details on grazing patterns and herd movements. I am still trying to ascertain exactly who owns livestock and which species mixes the herds are composed of. Attempts to get actual numbers of animals owned will be left to a later stage in the fieldwork. Tentative findings

from 28 people (out of 37 known adults) indicates the following species mix of hamlet herds:

- cattle only³: 10;
- camels, cattle, sheep and goats: 10;
- cattle, sheep and goats: 2;
- one each of the following mixes: sheep / goats; sheep / goats / camels; camels only.

Three people are reported to own no animals and two of these are women. This information was provided mainly from one person about his neighbors so must be checked for accuracy. It would appear, therefore, that the vast majority of people, both men and women, in the hamlet are involved with livestock whose herding requires some mobility on the part of the owners. My initial characterization of the population as agro-pastoral seems to be accurate.

Agricultural Innovation

Since 1975, the hamlet has been the site of various attempts to modernize the agricultural sector which have met with minimal success. Some of the interventions will be briefly mentioned as will possible reasons for their failure. The Agricultural Cooperative representatives came out in 1975 and encouraged people from several surrounding hamlets to form a cooperative group and begin working on a cooperative farm (tacab wadag). The first three years the people did the work manually and cooperated with one another quite successfully. In 1978 bulldozers were brought in to cut down trees and level the ground. This latter action was improperly done so too much standing water remained on the farm after the rains and the crops failed. The members tried to rectify the matter by contacting some of the cooperative authorities in Baidoa who did nothing to help them. From this point onwards (1978-1979), people began to desert the cooperative and by Gu 1983 there was no labor at all performed on the

cooperative farm. Attendance at a general meeting of the Agricultural Cooperatives and informal conversations with local members indicates that there is a great deal of dissatisfaction and disillusionment with the notion of cooperatization.

The oxen training fiasco in 1978 came next with conflicting reports coming from farmers and the local Ministry of Agriculture personnel. There is a fundamental conflict between the Extension Service which is promoting animal traction on small scale producers' farms and the cooperative approach which prefers large scale mechanization. The farmers say that the oxen trainers and other Ministry of Agriculture personnel came from the Bonka Farmers Training Center in Baidoa to give them instructions in new farming techniques and to train their oxen to pull plows. Seven oxen from the area were trained and the farmers were introduced to planting in rows and other new methods and were given peanuts and mung bean seed. The plow is lying unused in the hamlet today. The explanation given is that there was no food available for the oxen during the dry jiilaal near the hamlet so the trained animals were sold off. A local extension agent claims that the real reason is that people do not want to feed hay to their cattle as proposed by the trainers nor do they want to make their livestock work. Farmers have said, however, that they use camel power to pull the kowawa, a tool used for making ridges in the fields.

There has been some experimentation and acceptance of peanuts and mung beans, but planting in rows has virtually been abandoned (if it ever was popular) except for four demonstration plots. Farmers claim that when hoeing and seeding are performed manually then planting in rows is too much work and disease tends to spread faster than when plants are scattered. Removing all stalks and debris from the fields before each new planting is another innovation which has failed to catch on despite intermittent efforts from 1978

to present by American and Somali extension personnel to promote it.

I propose two reasons for the failure of modern agricultural interventions:

- lack of a proven technical package appropriate for local conditions which has been tested on farmers' fields coupled with a general ignorance of local farm management practices;
- the psychology of the developers, by which I mean the attitudes which agents of change adopt towards the local population.

Other researchers have mentioned these problems including Schmidt (1981), Nissly and Martin (1982) and Hunting (1982) for the first and Boston University (1983) for the second, but I would like to reemphasize these points with some specific examples.

Conversations with farmers reveal that they firmly believe that leaving stalks in the fields provides two or three benefits: it acts as a fertilizer by keeping the earth new, it helps to hold the soils down when it is very dry and windy. Farmers add that one does not see any insects in the stalks when they are dead and dry, but only when they are wet and growing. In contrast, extension agents claim that the main cause of stalk borer infestation comes from stalks left over in the fields from the previous season. Some farmers do not see any benefit from manure because it has a lot of insects in it, and some villagers in the region do not even let livestock graze in the fields but cut the stalks to feed them. Western farming, of course, is strongly committed to natural fertilizers such as manure or artificial products.

The extension agent's assumption that people are just too lazy to remove the stalks or follow his other advice needs to be examined. Demonstration plots which contrast modern techniques with traditional techniques will be needed to test

which method is superior under local conditions for empirical proof will be needed to persuade the farmers to change, which is as it should be. Furthermore, the present attitude of agents and some expatriate technicians that farmers are backward, ignorant persons who have no relevant knowledge to offer them needs to be reassessed. Agents can be quoted as saying "that on the basis of Agricultural Secondary School training and two and a half years working in the field I know much more about farming than middle-aged successful farmers". This problem is a familiar one in countries where new agricultural techniques are being promoted and was common not that long ago in the United States Extension Service.

Conclusions

This paper has presented some selected preliminary findings from an on-going study of household economics among agropastoralists in the Bay Region. By undertaking a traditional ethnographic field investigation I hope to contribute both to the scholarly literature on rural production strategies and social structure in Africa and to development efforts by providing empirically based background on people whose lives are being impacted by agricultural and rural development projects. A short term field study funded by one such project clearly demonstrated that survey research could not answer pressing questions about household structure and domestic economy which urgently need to be answered if projects are to be beneficial. At the same time intriguing questions about differences between the lives of northern pastoralists and so-called southern cultivators need to be addressed. This paper has documented how theoretical and practical concerns have merged in my own research in the Bay Region, providing one example of a pattern becoming more common in the discipline of anthropology.

ACKNOWLEDGEMENT

Grateful acknowledgement is made to the United States Agency for International Development, Mogadishu and Bryn Mawr College for financial support. Thanks also go to Maxamuud Cawaal Casayr, Omar Maxamed Xasan 'Chicago', Maxamed Cabdicasiis Sheekh Ismaaciil, and Xuseen Maxamuud Cabdiraxmaan for their skilled interpreting. A draft of this paper was read and commented on by Garth Massey and Sheila Nyhus of the University of Wyoming.

FOOTNOTES

- ¹ Information is missing on a man who left for the military six months ago and a man who has been off with the animals since our arrival and their respective households. Included is a man SM. and his household described below who live elsewhere much of the time, but whom local residents insisted be included.
- ² US \$ 1.00 = 15 SoSh
- ³ Cattle only; male pack camels not counted as per the hamlet people's emic categorization.

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Bernhard Helander / Hassan Awad Duaale

NOTIONS OF CROP FERTILITY AMONG DRY-FARMERS OF
THE BAY REGION

This paper attempts to outline notions of crop fertility among the dry-farming agro-pastoralists in the Bay Region in southern Somalia.

Many of the farming communities in Bay have, as elsewhere in southern Somalia, taken up agriculture relatively recently. It is possible to find villagers whose families were almost exclusively pastoralists only a few generations ago. This transition - although somewhat rarer today - is of very long standing in Somalia and has over the years been documented and analysed by several ethnographers (Colucci 1924:45-48; Cerulli 1959; Lewis 1969; Cassanelli 1982: 78-82).

Bearing this historical framework in mind, it is hardly surprising that agriculture practices appear simple compared to animal husbandry. Technologically there is very little that distinguishes the full-time farmer from the pastoralist with small scale farming as a side activity. Neither of them, for instance, practices crop rotation or fallowing. Similar observations can be made regarding the relatively sparse amount of traditional agricultural knowledge, compared to the amount of knowledge connected to pastoral production. Some recently settled pastoralists we met stated that they had learned agriculture by watching others.

Soil is generally not classified beyond the major distinctions between red (laterite) and grey soils, the latter being considered the best for agriculture. Some farmers do nonetheless have fields on red soil. A less common further subdivision

into the categories bariya (unplanted), duur (full of weeds) and salaax (excellent), is known only to a few and seems to have very little significance.^I On the whole most farmers attribute more importance to rain than to the quality of the soil. Rain and water are regarded as synonymous with prosperity in general (cf. Galaal 1968). The reasons for this are obvious. In an environment where - despite average annual rainfall of up to six hundred millimeters - rains may fail completely some seasons, grass cover and cultivated crops will probably appear more directly related to rainfall than to soil type (cf. Luling 1971:102). The same seems true also of the beliefs about the growth of the single grain. It is said that the "swelling" or "fermentation" (tarān) of the grain in the ground, is due to the presence of water in the same fashion as the volume of rice increases when boiled in water.

When moving from this level of explicit statements of cultural common sense, to the more subtle domains of symbolic and religious practices related to agriculture, one discerns a vast field of semantic relations that adds another dimension to the traditional knowledge. It is the purpose of this paper to attempt to penetrate and discuss some of these relations. More specifically, we will look at how some practices connect the growth of crops to human fertility. We hold that this model of fertility is consistent with a culturally standardized view of agricultural production that emphasizes the importance of labour and produce, but attaches very little significance to immobile means of production (i.e. land). We will start by giving a brief sketch of how land, labour and produce are measured in the inter-river area, assuming the systems of measurement to be symptomatic of deeper attitudes. Then one of the particular measurement systems will be analysed, since it is illuminating for how notions of crop fertility link to human re-

production. Finally, these findings will be compared to a particular ritual that further connects crop fertility to human fertility.

Systems of measuring fields in southern Somalia have recently been described by several authors (e.g. Haakonsen 1982; Lewis 1981; Luling 1971). It is interesting to note that although some standardized units are in use, the actual size they designate varies considerably from region to region, between districts and, sometimes, between neighbouring villages. In the Lower Shabelle Region for instance, the standard unit employed is the pace (tilaab), two times two of which make up a moos. A row of forty moos is called cul and twelve such rows side by side are called one darab (Luling 1971:91-92). As the basis of this system is the pace, a darab when rendered into meters, has been found to vary between 2.015 and 3.374 square meters (cf. Haakonsen 1982: 28). It should further be noted that the number of moos per cul also is subject to variation. Luling (1971:91-92) registered as many as 60 moos per cul in some places along the Shabelle river.

Although the term darab is vague, it is the most widespread unit of measurements in the inter-river area. The units cul and moos appear to be restricted to the riverine population and are not familiar to the inhabitants in the west and centre of the Bay Region. In the latter area a darab is measured solely by double paces, thirty times twelve of which constitutes the unit. Further west, the word darab is known to some farmers but almost never used. Although the unit they use (for instance in deciding wages for hired labour) approximates the darab, or ten times thirty double paces, it is simply referred to as this number of paces (tilaabo).

In this latter area another kind of "system of measurement" can be found in the villages where the size of a field is talked about as being a certain number of Yasiin and Tabaarak. These terms are not primarily to be conceived of as units of measurement, but must instead be viewed in relation to the religious practices of which they form an integral part. We will return to an analysis of these practices below.

However, it should first be noted that the fluidity of land measurements contrasts to the fixed standards by which agricultural labour and produce are measured. When, for instance, setting the wages for hired labour the farmer and the worker may discuss at length the various variables that will affect the wages. It is decided according to the precise tasks to be carried out, combined with an estimate of the time needed and the size of the field. For clearing, weeding and harvesting, some farmers use an area measure that is ten times thirty double paces.

A labour intensive task is the annual or seasonal reexcavation of the rainwater reservoirs (sing. war, pl. waro). When this is to be done the dried out bottom of the war is divided into as many squares or rectangles as there are member households. The division is done by using sticks with fixed lengths of between two and four underarms (depending on the size of the war). After the division has been approved of, representatives from each household dig out the indicated areas and when they have finished, the man in charge controls the depth of the shafts with the measuring-stick.

The grains (i.e. mainly sorghum and maize) have also traditionally been measured with great exactitude. The standard measure is called suus and is said to be equal between one and a half kilogram, formerly the suus corresponded to a wooden bowl in use throughout southern Somalia (Ferrandi

1903:347), but it is nowadays replaced by empty tin cans. Although one author has claimed that the actual weight of the suus is below that stated, we were led to believe that it, at least nowadays, is a fairly accurate measurement. When for instance local ADC (Agricultural Development Corporation) agents collect the harvest from individual producers, they use the suus to measure the content of sacks. This is rarely done without having a balance available in the vicinity to check the actual weight of the full tin can. Even granted that this may be a relatively recent standardization due to the increasing presence of ADC, the different units for quantity measurement do not possess the same flexibility in relation to one another as the units for area measure do. Thus twelve suus are invariably equivalent to one tanag equal one sack or juuni.²

On the whole then, it seems justified to conclude that more significance is attributed to quantities of labour and produce than to sizes of fields. The importance of this for the present analysis will be discussed more thoroughly below. It is sufficient here to mention that we take these differing standards of measurement to reflect deeper attitudes to labour, land and produce.

Let us now return to the "measurement system" in which the size of a field is given by the terms Yasiin and Tabaarak. Yasiin and Tabaarak are two chapters of the Koran, number thirty-six and fifty-seven. In English translations the latter is more generally known as Al-Mulk (The Sovereignty), but the word Tabaarak ('blessed') is the first word in the first verse and is the name employed in the areas where this research was conducted. The meaning of the word Yasiin was not known to any of our informants. It is derived from the two letters of the Arabic alphabet which stand in

the beginning of the first verse.

The reason for giving the size of a field by these two names is that following the clearing of a new field and thereafter before every new period of sowing, the two suras are read while walking slowly across the field. The man doing this (it may be a sheikh or just the man who owns the field) starts with Yasiin and when it is finished, continues by reading Tabaarak then switches to Yasiin again, and so on until he reaches the other end of the field. Thus a field may be said to be "two Yasiin and two Tabaarak". It should be emphasized that this is not an area measure, according to most informants it is only done lengthwise and hence the width of the field remains unmeasured. It does not, however, remain completely unknown; most of the fields are roughly squareformed, and farmers would when requested estimate the distance in the other direction in Yasiin and Tabaarak. Yasiin and Tabaarak have a variety of different uses in many different contexts. By examining some of these other uses and their connotations, we hope to be able to shed some light on the cognitive background of their use on the fields.

However, it is necessary first to say a few general words about the explicit beliefs connected to these two suras. Yasiin is said to be the "heart" and the strongest part of the Koran. We found that most people, even if they did not know the whole of the Koran, would at least be able to recite large parts or the whole of this chapter. The number of verses - eighty-three - is said to be the same as the number of days in the ripening period of the coconut. Tabaarak is said to be almost as strong as Yasiin. It has thirty verses which is equal to the number of days in a month. Both of these suras are also believed to be good to use for protection in general and also to achieve short-term aims such as restoring health and acquiring wealth. Apart from these more general conceptions of the two suras,

it is particularly instructive to examine some of the specific uses that they have. Yasiin is said to make a man indefeatable if he reads it before the battle. Another, and one of its most important uses, is for the curing of male genital disorders and impotence or sterility in particular. When used for this purpose, Yasiin is read a certain number of times by a sheikh over a bowl containing holy water (maa'ul ward). While reading, the sheikh spits into the bowl and then gives it to the patient who drinks the water and regains his strength. Another context where Yasiin is used is during the construction of a mundul (hut). When the building is completed, a sheikh will be asked to read Yasiin seven times. Finally, following male or female circumcision, Yasiin is read into water that is given to the boy or girl in order to heal the wounds.

Tabaarak in turn, has perhaps its most important use in the practices connected to the curing of female infertility. If, for instance, a menstruating woman drinks water into which Tabaarak has been read, she will become pregnant immediately. Furthermore, if a boy is in love with a girl but she refuses to allow him to approach her, he may secretly read Tabaarak into water that he knows she will drink. When she does, she will fall in love with him at once. A husband whose wife refuses him in the same way, may by the same procedure regain her confidence. Tabaarak may also be read for a cow that refuses to give milk to her calf (see figure I).

A complete enumeration of all the different uses of Yasiin and Tabaarak is impossible and unnecessary for the present purpose. The most important ones are those that are not restricted to the knowledge of sheikhs, but knowledge common also among laymen. It is possible to enlarge the list with the more uncommon practices of different sheikhs, but we are here trying to find the associations made by ordinary people and not only by specialists.

Figure I. The different contexts in which Yasiin and Tabaarak are used.

Yasiin	Tabaarak
To make a man indefeatable in combat	
During <u>mundul</u> construction	
To heal wounds after circumcision	
Read on fields before sowing	Read on fields before sowing
To restore male fertility	To restore femal fertility
	To make a woman allow approach
	To make a cow give milk to her calf

From this list of the different contexts in which Yasiin and Tabaarak occur, it is possible to discern some general characteristics that are attributed to the two suras. Yasiin appears to have male association as it is connected to male fertility. In addition, warfare and mundul construction are typical male pursuits. Tabaarak on the other hand, seems to carry a female connotation through its link with female fertility and its power to alter the feelings of women. It can further be noted that the only similar context - apart from the procedures on the fields - in which both of them are used, is precisely to restore the fertility of men and women respectively. We believe therefore that the custom of reading Yasiin and Tabaarak on the fields, reflects a conception of fertility based on the complementarity of the

sexes. By reading the chapters of the Koran that are used to engender male and female fertility respectively, human fertility is transferred to the crops. There are a number of other indications that support this interpretation. The most striking example is perhaps the legend of a Sufi saint, Sheikh Muumin of the Salihiya Order. He died some twenty years ago, but the ceremonies (roobdoon, 'rain-seeker') he used to conduct in times of drought are still remembered with veneration. It is said that if the rains failed after the period of sowing, Sheikh Muumin went out of the village to the fields where he erected a hut (hoori) and stayed for seven days. He was accompanied by a man from the village who cooked for him. He only ate at nights and devoted the days to praying and reading from the Koran (we were not told which parts). During this seven-day period he remained in complete celibacy and on the last day the villagers came out to the field and a big feast was held. The rains then started and the grain began to grow.

To comprehend the way in which the roobdoon of Sheikh Mumin is connected to human fertility, it is necessary to introduce a few further facts and compare them to the basic structure of the series of events in the ceremony. First, the sheikh went out of the village and to the fields that are always located outside the village in the bush. The bush/village distinction is one of the most basic spatial demarcations in this area. It is also a social distinction but as such a relative one: most families have sons that have spent or will spend some years with the family herd in the bush and hence by definition become "bush people" (reer badiye). This designation is commonly applied as a pejorative to herdsmen visiting larger villages to barter or trade their products. It is also quite often jokingly used between friends, and contrasted to the "village people" (reer

tuuledo). What is important to note is that the "bush" and the "village" exist as explicit cognitive categories. Secondly, Sheikh Muumin stayed on the field in celibacy, for a period of seven days together with another man. When the period was over the people from the village gathered on the field for a feast. When this series is viewed in relation to other occasions at which ritual seclusion of any kind occurs, and especially other contexts in which large portions of the village population is gathered, it becomes quite evident that Sheikh Muumin's ceremony was structured as an inversion of the marriage ceremony. A marriage is always held in the village. It starts with communal feasting after which the married couple withdraws their mundul for seven days. During this time they must both abstain from praying since sexual contacts make a man (and woman) impure (see figure 2).

Figure 2. The roobdoon of Sheikh Muumin as ritual inversion of the marriage ceremony.

	The roobdoon	Marriage
Location	the bush	the village
Period of seclusion	seven days	seven days
Participants	male/male	male/female
Communal feasting	at the end of the ceremony	at the beginning of the ceremony
Prohibitions	sexual intercourse	prayers (religion)
Main activity	prayers (religion)	sexual intercourse

Some of the opposition in figure 2 may deserve our further attention. The bush/village contrast should appear fairly

established by now, and beginning/end of ceremony is also uncomplicated. However, it is by no means self-evident that male/female is an opposition to male/male. Our reason for depicting this as a crucial contrast is based on the scheme $A : B :: a_1 : a_2$. Theoretical support for this scheme in the context of gender symbolism in the Muslim world, has recently been advanced by Bourdieu (1977:44,208). One may also say that male/female is to male/male as complementarity is to non-complementarity. Regarding the last opposition in which sexual intercourse appears as opposed to religion (diin), it may be added that the two are opposed only in so far as the exercise of the former inhibits the exercise of the latter and vice versa.

Hence, the scheme as a whole depicts some structural properties of the marriage ceremony in relation to the roobdoon that Sheikh Muumin held. When these two ceremonies are regarded in this abstracted way the one appears as an inversion of the other. This inversion consists of the reversal of the model of the marriage ceremony and the replacement of the single elements by their cultural opposites. We have attempted to demonstrate this in order to show that underlying the ceremony by which Sheikh Muumin brought rain and growth to the crops, was a basic pattern for the marriage ceremony and, by extension, human reproduction. On a high level of abstraction then, it would seem that in this world view, (agricultural) production and (human) reproduction are regarded as essentially the same or at least very closely linked.

There is one further point of support for this interpretation. Haakonsen (1982:27) observed that in the Lower Shabelle "clearing of new land is described by the verb furasho, to open, and it is vividly compared to the 'opening' of an infibulated virgin girl, while the scratches one invariably

gets from clearing away thorny plants and underbush are compared to the scratches which may be incurred during the sexual act".

To sum up, we have tried to analyse the use of Yasiin and Tabaarak on the fields in terms of the different contexts in which these two suras are used. We have suggested that since Yasiin has male connotations and Tabaarak female, reading both of them on the fields could be seen as a means by which complementarity of the sexes and human fertility is transferred to the germination of the grain. We found further support for this by analysing the roobdoon of Sheikh Muumin. We showed how this ceremony in fact rested on an inverted model of the marriage ceremony, i.e. the epitome of sexual complementarity. The sexual metaphors for work on the fields, are additional indications that grain production and human reproduction are regarded as very closely related phenomena.

In the introduction it was suggested that many ideas and practices linked to the traditional dry-farming in southern Somalia, become more intelligible if viewed in the framework of agro-pastoral transition. The points made in this paper could on one level be seen as referring to an essentially pastoral knowledge system adapted to a new type of production. This might provide an economic background for the different attitudes to labour, land and produce. As we have tried to demonstrate, the agricultural ideology emphasizes precise quantities of labour and produce, but provides vague concepts of soil quality and field size. This is, furthermore, consistent with our findings regarding the representations of crop fertility; there is nothing in the religious and symbolic practices that we have examined that suggests a link

between any kind of concept of fertility and soil. Indeed it may be more than a coincidence that a knowledge system that so emphasizes the labourer and the grain, also regards the fertility of the former as a model for the fertility of the latter.

ACKNOWLEDGEMENT

The material presented in this paper is based on field work conducted in the Somali Democratic Republic during July to September, 1983. The research was supported by the Swedish Agency for Research Cooperation, the Swedish Council for Research in the Humanities and Social Sciences and the Johnson Foundation.

We are indebted to Dr. Kaj Arhem and Ms. Enid Nelson for their comments and language corrections.

FOOTNOTES

- I Naturally other names exist that are applied to the land. Most of them, however, are jural terms rather than classifications of soils. Many of the early authors who discussed the jural terms for land, encountered problems in the analysis of traditional forms of ownership (see Colucci 1924:204-222; cf. Guadagni 1981:59-87). Perhaps some of these problems could be resolved by also looking at what land is to the farmers, and not only how it is owned.
- 2 The juuni is more commonly known as "quintal".

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Stefan Helming

SMALL-HOLDER IRRIGATION AGRICULTURE - ITS ROLE IN
NATIONAL DEVELOPMENTI. The Crop Production Sector

I.I. Relative Importance

Although in the predominantly nomadic and livestock raising Somali economy farming does not take up the overwhelmingly important role it plays in most other African societies, it should still be considered one of the major sectors, about equal in weight to transport and construction, and much more prominent than manufacturing.

Farmers provide basic staple foodstuffs, mainly sorghum, maize, sesame, sugar, fruits and vegetables, to feed the settled urban and rural population, and as a supplementary diet for the nomads. An estimated number of 200.000 families or 20% of the total population are farmers either permanently settled or as semi-nomads.¹

The contribution to the national value added amounts to about 7% to 10% of GDP, and agricultural export (banana) account for 8% of all exports.

There is a broad consensus that physical resources for agricultural production are underutilized to a considerable extent in Somalia. Out of the total land area of 638.000 km², about 13% or 8.3 million ha are thought to be potentially suitable for farming. But currently only about 700.000 ha are actually farmed each year. Out of these, roughly 110.000 ha receive more or less improved flood irrigation, and 50.000 ha are served by controlled irrigation facilities. The rest of the cropping areas relies on rainfall only. Thus less than 10% of all potential rainfed areas are actually

cultivated, and somewhat around a third of the potential irrigation areas.

Agriculture is concentrated in the southern regions of Somalia, where rainfall reaches 400 to 600 mm in average years, along and between the two rivers. Some farming also takes place in the North-West Region. In all other parts of the country farming is limited to small vegetable gardens around springs.

I.2. Major Subsectors

For the purpose of socio-economic analysis, three major types of farming enterprises can be distinguished. These are:

- independent small-holders in rainfed or irrigation areas;
- state farms, communal farms of cooperatives, settlement farms and the like;
- commercial enterprises, mostly banana farms.

Although in some individual cases, it would be difficult to assign a particular farm to one of the three types, in general the distinction is quite clear-cut and the criteria are easily defined.

Commercial farms: These enterprises will typically be owned by Somali investors who in many cases are not residents of the location of their farm. Most of them produce bananas for export. This type of farms is concentrated in Lower Shabelle and Lower Juba regions, in areas equipped with irrigation infrastructure (barrages, main and secondary canals, etc.) by the former colonial administration for Italian settlers. The subsector experienced a dramatic decline in productivity and production in the second half of the 1970s, due mainly to a lack of price incentives from the state marketing institution, the National Banana Board, and a lack of imported inputs. Recently, prices were raised, and the Banana Board was merged with an Italian private company to form a joint venture named "Somali Fruit Company", responsible for

marketing, export and input supply on a monopoly basis. The company is also expected to develop new export crops like grapefruits.

In response to these new developments, banana production and exports as well as yields increased remarkably in 1982, and the recovery can be expected to continue. Currently, banana exports amount to less than half the quantity sold in the early 1970s. The maximum area used for bananas was about 9,000 ha in 1972, out of which less than 3,000 ha are currently used.

Besides bananas, commercial farms grow a wide variety of fruits and vegetables for the urban markets. With the general liberalization of the economy, more businessmen can be expected to become interested in this type of farm.

State Farms: The terms "state farms" is used here to include also most of the communal farms of cooperatives and the nomad settlement projects, that is to say all agricultural enterprises run by the government or parastatal agencies. Their common characteristic are a highly centralized management organization for each enterprise responsible for an area of between one hundred and several thousand hectares. Usually, these farms were constructed from capital aid provided by foreign governments and according to plans designed by foreign consultants. They can be expected to be highly mechanized. The total area developed for this type of farm is currently approximately 30,000 ha on irrigated land and about a further 10,000 ha are in the planning or construction phase.² Main products are sugar, rice, maize and cotton. This type of enterprise has experienced extraordinarily great problems since its inception in the early 1970s.³ Capacity utilization and yields are generally far below any levels warranting the immense amounts of capital expenditure effected on the farms, and they are most often even insufficient to cover current costs. Without going into

details here, major reasons for the disappointing performance are inadequate management, lack of foreign currency, and insufficient incentive to labour, leading to idleness of machinery and poor agronomic practices. The waste of capital predominantly provided through hard currency loans to the state has led the government to reconsider this type of investment policy, searching for new organizational models for its large-scale modern-technology agricultural development projects. The new Five Year Development Plan states that during the planning period 1982 - 1986 no new state farms shall be established.⁴

Small-holders: Small independent farmers grow the bulk of Somalia's food crops maize, sesame, and sorghum. Their production methods are usually based on hand labour, and except for a few tools all inputs are made on the farms. Production, of course, is largely subsistence oriented but in good years a substantial portion of the output is sold on the market.

Because of livestock and incense trade links to the Arab peninsula, the rural Somali economy has known monetary exchange mechanism for centuries. Farmers sell grain to buy animal products and industrial goods. With the government's restrictive pricing and marketing policies of the 1970s, the amount of grain sold has somewhat declined or been re-channelled to the black market. Recently, the government has taken up a more liberal policy. Therefore, small-holders are slowly adopting a more open attitude towards marketing.

Farming is concentrated in the rainfed areas, but a certain portion of the farmers living along the two rivers practice irrigation to augment the rainfall their crops receive and minimize drought risks. The latter type of cultivation, covering an estimated area of around 100,000 ha, shall be described in more detail in the following pages.

2. Small-holder Irrigation Agriculture - How does it function?

2.I. Methodology

The information contained in this chapter derives from a series of group interviews conducted with village leaders between 5 to 10 farmers each, and with a number of individual farmers. For both types of interviews written guidelines were used so as to get a consistent picture of all villages. The discussions took place in a remarkably open atmosphere, with a considerable number of participants giving their own opinions. Sometimes lively arguments took place over complicated problems, but always led to specific group answers.

The interviews took place during the Hagai rains, when the Gu season crop of maize was 4 to 8 weeks to harvesting. Supplementary information was drawn from a number of published documents.⁵

Clearly, this type of analysis can at maximum serve to give a first indication of the sector's functions and problems; it cannot replace full-fledged agronomic and sociological research on Somalia's farmers.

Existing information on the sector is scarce and inconsistent. In the past, studies and other documents prepared by aid donor agencies for the government in the course of project preparation and implementation, and which as a whole probably represent the largest body of written information on the country, have tended to disregard the irrigation small-holder sector altogether. As regards sociological features, the only document known to the author is a paper presented by I. M. Lewis in the 1960s presenting a general outline.⁶

The interviews were conducted in two areas of Lower Shabelle region, one between Aw Dheegle and north of Genale, and the other from south of Qorioley to the proximity of Kurtun Warey. These areas were selected because

- no large development projects exist here;
- irrigation is of the traditional "improved flood irrigation" type, and the areas have no access to Genale banana-growing canal system;
- both areas are known for a long tradition of strong agricultural production.

2.2. Physical Resources

The annual cycle of the semiarid climate is determined by the two monsoons - north-east from December to March and south-east between May and October, interrupted by less windy seasons in April and November. The mean annual precipitation is around 470 mm, distributed mainly over two rainy seasons. The Gu season is recording the highest rainfall between April and June. The second and less pronounced rainy season is the Der season starting in about middle of October, up to the end of November. In between the two seasons the coastal showers (Hagai) bring light rainfalls, and cloudy sky. The real dry season occurs during the months from January and March (Jilal). Although overall rainfall is one of the highest for the whole of Somalia, the lack of reliability both in quantity and distribution of rains constitutes a constant threat of either droughts or floods.

The soils are heavy clay of alluvial origin. The shrink and crack deeply during the dry season, while the cracks close and the soil becomes smeary when wet.

The Shabelle river is the second largest in Somalia. The water quantity is determined by rainfalls in the Ethiopian highlands. High flow periods enabling gravity irrigation last four to six weeks in May and June in the Gu season, and between two and three months from September to November in the Der season, riverflow data for these periods being between 60 and 70 m³/sec.

2.3. Social Structure

Population figures for the area are difficult to obtain. The main reasons for this are that an unknown number of nomads migrate into the region during the long dry season, that a portion of village residents are semi-nomads moving in and out of the area with changes in weather and economic conditions, that there is some migrant labour from the Bay region at certain peak labour periods, and that population data are often established by the village for the purpose of distribution of food rations which might lead to exaggerated figures. The numbers obtained during the interviews give an average of 350 families per village, with 8.4 members per family and around 3000 inhabitants per village.

The families are usually composed of the husband and one or more wives with their children, plus possibly a few unmarried close relatives. In some cases, a family head will have one wife with children in the village and another wife in the livestock grazing areas in the Bay region. Other village families will completely move to the livestock regions during the rainy season, thus being unable to do intensive farming.

Size of land holdings vary considerably throughout the area, and the average farmer can be expected to possess about 2 to 10 hectares. There are no indications that land scarcity constitutes a major problem for a large number of farmers in the area. In case a family wishes to cultivate more land than it owns, there is always an option to rent land from large holders or absent semi-nomads.

Each village has a village committee led by a village chairman. He is usually also the chairman of the local party unit. The committee acts as counterpart to the district and regional authorities in all matters pertaining to rural

policy. There are cooperatives of different types in the study area. The most common is the multi-purpose cooperative, established in most villages to facilitate purchase of inputs, procurement of tractor services, and the like. The majority of these cooperatives have kept a low profile of activities. Where they exist, membership is universal. Sometimes their main purpose is seen to function as a relief agency in case an emergency should arise, and to mobilize farmers to fulfill national development and political goals.

Group farms represent another type of cooperatives, which like the former belong to the Union of Somali Cooperative Movements being in turn a section of the party. They usually consist of 100 ha provided by the government together with tractors, tools, and inputs. They are farmed by about 20 families communally. The settlements of religious communities represent a third type of cooperative. The land is worked on a communal basis, without individual claims to land.

2.4. The Irrigation System

The villages studied get water through small hand-dug canals, only during periods of high river flow, that is for about four to six weeks on average in the Gu season, and between two to three months in the Der season. The canals are from a few meters to six kilometers long, 30 to 70 cm wide, and usually not deeper than half a meter. Most of them have been built at least fifty years ago, for nobody in the village can remember their construction. They are usually completely made of earth, with no concrete structures whatsoever. Sometimes wooden poles are used to help block the intake on the river. Water control is achieved through small earth banks which are removed to allow the water to flow into branch of field lateral canals.

Canals are operated and maintained under an indigenous cooperative system.

All the farmers served by a specific canal (from 10 up to 100 farms) form a canal committee. The committee is headed by an elected chairman called aw or oday. Depending on the size and length of the canal, the chairman has one to three helpers, called sagaalo or yersin. These are also elected by the farmers. In order to qualify for the office of chairman or helper, a person should meet certain requirements. Both should possess fields on the canal. The chairman should be known for wisdom and justice, be a good farmer, should be able to mobilize people, and preferably have been a helper before. Helpers should be strong men, should have a reputation of regular work on their fields, and of reliability. Unless displaced by a committee decision, both chairman and helpers may remain in post for many years.

In case anyone notices a damage on the canal, he will notify the helper, who will then in turn either repair it immediately or inform the chairman and call together a work force of men to do the repair.

Water distribution is decided upon by the chairman, and the related work of opening and closing laterals or field inlets are carried out by the helper.

The main principle governing water distribution is, that each farmer will get 24 hours of water, i.e. the canal is blocked for one day and water is diverted into his field, irrespective of the size of the plot. Thus, a farmer possessing more land than can be irrigated during 24 hours will have to wait his turn again for the irrigation of the rest of his field. Water distribution always starts on those plots closest to the river, farms being served one by one with growing distance to the river. An exemption is made when farmers farther inland are ready for irrigation earlier than the ones close to the river. Whenever there is

a shortage of water, daily meetings take place at the house of the chairman to define the following day's water use.

The water distribution regulations are not monetized, the chairman deciding on water allocations purely on the ground of set rules and practical considerations but not of financial capacities of individual farmers. Small fees of between five and twenty shillings are levied, however, mainly as an equivalent of the chairman and his helper's services not as a payment for water.

Maintenance and cleaning of canals is effected before a new season starts. All farmers served by the canal are appointed certain stretches to clean. They can either do the work themselves or have them done by hired labour. A farmer not fulfilling his duty will obviously become quite conspicuous and sanctioned by the committee. In case anyone fails to clean his stretch, it is the chairman's duty to see to the completion of works, if necessary out of his own resources. The work is supervised by the canal helper, who in the evening reports to the chairman.

There is a rule governing allocations of stretches to clean, stating that all farmers have to work on the first stretch from the river up to the first lateral canal, but only those served by the next stretches continue, so that the farmers at the end get no help from those situated close to the river. This rule is probably a reflection of the diminishing size of canals with growing distance from the river, and it also facilitates admission of new members to the canal committee, who, their fields being the last in line, augment the work force on the old stretches.

2.5. Agriculture

By far the most important crops in the study area are maize and sesame. All other crops play a minor role. Maize is the dominant Gu season crop and the main staple food in the

area, and it is grown predominantly for subsistence purposes. Maize is usually not a very interesting crop from the commercial point of view. Surpluses are sold only if the food requirement of the family including a reserve for drought seasons are met. Maize is stored close to the family's home in underground pits where it can be kept for several years in edible condition, although the quality deteriorates. Farmers stated that on average they need about 0.17 quintals of maize per family member and month. These figures would lead to a yearly requirement of 17.15 qt (1 qt = 100 kg) for a family of an average size of 8.4. The figures have to be taken cautiously as the number of farmers interviewed is too small to provide for definite conclusions. They can give an indication of the order of magnitude involved, however. As average maize yields in poor soil areas with insufficient irrigation will hardly exceed 6 qt/ha, farmers here would have to cultivate at least three hectares each Gu season only to feed their families.

In good areas, yields can be as high as 15 to 20 qt/ha or more if the land is worked with care, and one hectare might be sufficient to grow food for a family.

Sesame is the main cash crop and it is predominantly grown in the Der season. Sesame is exclusively sold for further processing into oil and animal feed, usually to small oil mills in the villages. Most settlements dispose oil mills owned by private individuals, operated either by a camel or by a small engine. Sesame processing in the villages is not hindered any more by the government as it was the case for a while, to encourage processing at the large oil mill in Mogadishu. Sesame oil is favoured greatly by the Somali consumer over imported soy bean and similar oil types, and fetches high prices. It is an interesting cash crop, and a poor sesame harvest will fetch twice the income of an above average maize crop grown on the same plot of land, production

costs being similar in magnitude.

It is very difficult to establish a single yields figure for the main crops, because the wide variations caused by soil fertility differences, fluctuations of the climate, discriminate access to water, and farm management practices, make any statistical mean value meaningless. There are farmers who consider a yield for maize of above 20 qt as normal, whereas others are happy to receive 6 - 8 qt. Most farmers probably achieve a production in the range of 7 to 12 qt in a normal year. We shall use the figure of 10 qt/ha as an average yield value, keeping in mind that the figure has little significance for the individual farmer.

The situation is similar for sesame. Average yields quoted in the interview varied between 4 and 8 qt/ha. As most of the sesame and part of the maize, plus a good deal of fruit and vegetables not covered in detail in this paper are sold, the area provides a considerable surplus of marketable goods.

Today, almost 100% of all marketing is through private channels. Sesame is sold to small oil mills, and maize and other crops are either marketed directly in the village or taken to city markets. For maize, traders (mostly women) come with lorries from the city to buy the produce. The same system is also used for fruits and vegetables, but sometimes farmers will hire a lorry and take their produce to the marketplace themselves. The Agricultural Development Corporation (ADC) used to play a major role in marketing and maintains a number of storehouses in the area, but its activity is now of minor importance after the government's decision to deregulate food marketing. This liberalization has, however, not been based on any policy pronouncements, and according to the law ADC's monopoly on grain marketing remains unchanged. One might speak of a policy change "through the back door", but it definitely has a great

impact on the rural areas.

Prices received by the farmers fluctuate considerably between seasons, especially for maize. The minimum price for maize paid after the last Der season harvest was around 200 SoSh/qt, slightly above the officially guaranteed ADC price of 180 SoSh/qt.⁷ Prices increase sharply when the season advances, and at the time of the interview (early July, about 4-5 months after the last harvest) prices for stored maize were 400 to 500 SoSh/qt, and for fresh produce could be as high as 800 SoSh/qt. All prices are for shelled maize.

Sesame prices fluctuate somewhat less, the minimum being about 1000 SoSh/qt, and the maximum 1400 SoSh/qt. The prices quoted most often were in the region of 1200 to 1300 SoSh/qt.

The main difference in farming techniques between maize and sesame is that sesame is sown after the field has been flooded completely for about four weeks and the soil is soaked with moisture, whereas maize is sown after the first heavy rains and later one or more irrigations are applied. Cost-intensive operations like land preparation and weeding are basically the same.

The first step of cultivation is land preparation. The land is ploughed and small bunds are made, dividing the plot into basins of 1/16 of an hectar. This operation is almost always performed by a hired tractor. Four hours are needed to plough one hectar, and one tractor hour costs on average 150 shillings. An additional quarter of an hour is sufficient for bund-making. Thus the cost for one hectar, to be paid as out-of-pocket expense by almost all farmers, is about 640 SoSh. Most tractors in the area are privately owned and stationed in the larger villages.

Sowing is usually effected by hand, with seeds filled into small holes. If sowing is done by hired labour, the cost per hectar varies between 240 to 320 shillings. The cost depends

on the soil conditions, cheaper rates being applicable when the soil is dry.

Weeding is by far the most expensive operation in terms of labour cost. Unless performed by the family, contracts are given to casual labourers at a rate of 800 to 1120 SoSh/ha for the first weeding, depending on the thickness of weed growth. Rates for second and third weedings are between 400 to 800 SoSh/ha. The number of weedings depends on rainfall or irrigation frequencies, and on the labour and/or financial capacity of the farmer. Often, weeding will not take place more than once. Weed control can be considered one of the most important agronomic problems, and its intensity increases with the number and quantity of irrigations. The use of chemical herbicides has not been introduced in the area.

The irrigation method has been explained above. Irrigation does not involve considerable financial costs apart from the small fees paid to the canal operations. It is impossible to "buy" allocations of water. Farmers cultivating larger areas do not necessarily get a larger share of the water.

Harvesting is divided into several sub-operations allowing for a certain flexibility in labour demand. The stems are cut, collected in the center of the field, and made into stooks. After drying, the cobs are picked and transported to the village.

Table I provides a summary of the different production cost items for maize. No variable costs other than machine hire and labour are included, because chemicals are not widely used, and no machines or capital items (fixed cost) are in the hand of farmers.

Table I. Production costs / ha for maize, Gu season 1983

Activity	Average cost/ha (SoSh)
Land preparation: hired tractor 4 1/4 hrs at 140 to 160 SoSh/hr	640
Planting: 15 to 20 SoSh/jibaal	280
Weeding: First - 50 to 70 SoSh/jibaal	960
Second - 30 to 50 SoSh/jibaal	640
Third - 25 to 30 SoSh/jibaal	440
Cutting: 10 SoSh/jibaal	160
Collecting: 10 SoSh/jibaal	160
Making stooks: 5 SoSh/jibaal	80
Transport to village: 10 SoSh/qt cobs at 20 qt cobs/ha (2 qt cobs = 1 qt grain)	200
Picking cobs	200
Shelling (machine): 5 SoSh/qt X 10 qt/ha	50
Miscellaneous (seeds, irrigation fee, taxes, guarding)	400
<hr/>	
1 ha	= 16 jibaal
Yield 1 ha	= 10 qt grain = 20 qt cobs
1 qt	= 100 kg = 1 quintal

source: field interviews

Roughly 80% of all costs are labour costs. Casual labour is generally hired on a contract system, a fixed sum being paid for the performance of a certain operation on a fixed

piece of land. The price depends, of course, on how strenuous the work is. Men, women, and children are being paid the same rate for the same contract. Any person can perform several contracts per day, if he or she wishes so. For example, when sowing a person will usually achieve 4 to 5 contracts per day, thus earning between 60 and 100 shillings. One person can weed two contracts per day, making 100 to 140 shillings. These are considerable earning opportunities for casual labour in a rural area, taking into account that a trained worker in the capital will not get more, and that university graduates employed by the government earn rather less.

Although not all facts could be established during the interviews it seems that only a small minority of the casual labourers are landless villagers but that in fact most of them are farmers themselves. There used to be a seasonal migration of workers from the Bay region to the agricultural areas along the river, but the people interviewed stated that this phenomenon has ceased to be of importance.

The high price of labour on one hand seems to be a reflection of the outmigration of a number of especially younger men to the cities and even abroad to the Gulf, on the other hand it has to be seen in the context of the nomadic background of the Somali society which usually does not involve strenuous labour on the land. In former times, labourers used to be imported from abroad to work on the fields. Today, with livestock raising still being the economically most promising activity in the country, there is no pool of cheap agricultural labour available to the farming areas on the river. There are no indications of the existence of a landless rural proletariat.

Considering the high price of labour, one might bring forward the notion that the main aim of farming is the maximization of leisure time to be devoted to social activities

under the condition that the family's basic food and cash requirements have been met. A lot more research into the rural labour economy would be necessary, however, to test this hypotheses and fully study its implications. The cost, yield, and marketing data of the previous chapters show that a normal maize crop will not warrant full use of hired labour.

Table 2 contains a tentative simplified crop budget. Situation I with full use of hired labour and normal yields and minimum crop values results in a considerable deficit. The farmer will have to reduce employment of paid labour or send family members to work on other people's farms. In situation 2 cost is reduced by 50% and the crop just breaks even. In situation 3 above average yields and a good market lead to considerably raised gross output, leaving a profit even when labour is fully contracted.

On average, it must be assumed that maize growing will not yield financial profits, but will rather serve to fulfill subsistence exigencies.

The situation is definitely different for sesame (situation 4). The growing costs in table 2 have somewhat arbitrarily been assumed to be identical to maize costs, because most cultivating operations are similar and because earlier studies have found sesame costs to be in similar magnitudes.⁸ Although sesame was not analyzed in detail during the research for this paper, the information gathered is sufficient to indicate a strong profitability of the oilseed, and one is safe to say that sesame profits may partly serve to make up for losses from maize.

The family income, of course, depends not only on the farming returns. Many families keep considerable herds of cattle in a semi-nomadic economic system. Others may have a good additional income from family members working abroad, or from non-agricultural activities, for example transport.

Table 2. Tentative crop budget for maize and sesame, 1983

	<u>Maize</u>		<u>Sesame</u>	<u>Unit</u>	
	(1)	(2)	(3)	(4)	
Yield	10	10	15	5	qt/ha
Price	200	200	300	1250	SoSh/qt
Gross output	2000	2000	4500	6250	SoSh/qt
Cost	3770	1805	3770	3770	SoSh/qt
Loss/Profit	-1770	125	730	2480	SoSh/qt

source: field interviews

Pick-ups and lorries used in rural areas are owned by village people, as a rule, to give an example.

In this context, farming for many families just constitutes one of several economic activities, helping to reduce overall risks, securing the supply of staple foods, and in good years contributing to a cash surplus.

3. Scope for Improvement

3.I. The Role of Small-holder in Agricultural Development

According to the Five Year Development Plan 1982 - 1986, "priority will be accorded to the development of small private farms", and "no new state farms will be established".⁹

This reflects a clear shift in policy objectives away from state and group farms, the priority development of which was stipulated in earlier plans.

It seems that a number of considerations have led the government to reevaluate somewhat the role to be assigned to independent small-holders:

- the problem of how to make the large state farms more productive has not been solved yet;
- the country must develop its immense irrigation potential in the Juba river valley, and it is not conceivable how the investment cost of \$ 10.000 to 20.000 per hectare needed for modern large scale farms could possibly be raised. Thus, self-financing small-holders will have to move in, using simple and inexpensive technologies;
- although the commercial farms are expanding it is clear that widespread agricultural development cannot be based on this subsector, because export markets are limited, and because the spread of this type of farm might not be socially desirable in long run;
- the government is now about to implement a programme of settling refugees who will not be able to return to their homeland, and many of these have an agricultural background and could possibly find a new home in the less intensively used farming areas as small-holders;
- it is imperative for the country to tap the resource of the accumulated knowledge and experience of small farmers for national development.

There are three major fields of government action in view to the promotion of small-holder agricultural production. Measures will become fully effective only if simultaneous steps are taken in all three.

There are:

- support services;
- improvement in infrastructure;
- general agricultural and economic policy.

3.2. Improvement of Supporting Services

The field extension service is still in its inception phase, and it will definitely be very helpful if it continues to test and improve its "message" to the farms, because there is a wide scope for improvements in farming techniques. The advice given to farmers centers on increasing plant population and row planting, timely planting and weeding, the introduction of chemicals like fungicides, insecticides and fertilizers which are given free of charge to contact farmers for trials, and cultural practices like crop rotation and intercropping.

This service's main problem will be that an effective extension service requires a rather sophisticated and well-managed public sector organizational framework. Experiences in Somalia and comparable countries show that it is very difficult to maintain such a service operational without continuous heavy technical assistance from abroad. Technical assistance, however, tend to be shortlived.

The banking system in Somalia is rather weak, comprising the Commercial and Saving Bank and the Somali Development Bank (SDB) only. There is no Agricultural or Rural Development Bank, and the SDB is therefore the only source of medium or long term loans in the country. As it does not maintain branch offices in rural areas, its effect on agricultural development has been limited in the past. Both banks will need more funds earmarked for agriculture, and more specially trained personnel. The installation of a private bank in Somalia might also help alleviate credit shortages.

The existence and functions of the banking system are well known to the small-holders. The concepts of both loan financed investment and seasonal credit is not alien to the socio-economic surroundings in the partly commercialized study area.

The public machine-hire service has had limited impact on small-holder agricultural areas. Possibly, a stronger involvement of the private sector or economically run co-operatives in the villages could help to put more tractors and other equipment at the disposal of farms. This point is of particular importance as the analysis above shows that labour seems to be the limiting factor for an increase in agricultural production. Animal traction cannot be employed in the study area mainly because of the heavy clay texture of the soil, but also due to tse-tse infestation.

Careful planning is needed for an input supply system to provide fertilizers, pesticides and improved seeds, if farmers become interested in this types of inputs in the future.

3.3. Investment in Infrastructure

One of the most important problems for the small-holders is the scarcity of water or better the lack of access to sufficient amounts of irrigation water when it is most needed. The canals are too small to bring enough water quickly to supply all those in need. Irrigation efficiency is usually quite low, and high seepage losses could be observed.

Inefficiency could also be observed concerning the distribution of water in the field due to imperfect levelling. A major problem concerning water control is flood protection. Many farmers visited could not cultivate because the river had inundated their plots.

Investment in "hard" infrastructure will have to be one of the government main areas of spending in the years to come.

This field includes both measures to regulate water flow in the rivers, controlling floods and bridging periods of low flow, and to increase infield irrigation efficiency.

The first type includes the construction of barrages across rivers, of flood relief channels, of embankments, of off-stream reservoirs, and if feasible, of high-dam storage reservoirs. About seven to eight weirs exist on the Shabelle river, enabling the farmers in their vicinity to use gravity irrigation during most of the year because of a constant high water level. In addition, an off-stream reservoir is operational near Jowhar, collecting surplus water during flood periods and releasing it in the dry season. More installations of these two types are needed.

As the Shabelle is a small river the irrigation capacity of which might soon be overused, provisions for better water management are essential. At present, huge amounts of water are lost every year due to a very low irrigation efficiency in the existing agricultural projects. The Ministry of Agriculture's irrigation operation and maintenance service is very weak. The government is considering to set up a Shabelle river authority to take care of water management and water use coordination.

On the Juba river, the huge Bardheere dam project is under preparation. It is expected to solve all water management problems for the river at one blow.

Equally important is investment in farmer's irrigation facilities. The canals used by small-holders are well managed and maintained, but they are technically inadequate to provide full water control. Programmes to give technical advice and credit finance to the farmers could, if well implemented, greatly improve small-holder's productive capacities. Such programmes would have the advantage that investment costs would, at least partially, be met by the farmers themselves, thereby reducing the government's spending burden.

Other major infrastructure fields warranting public investment include rural telecommunications and roads. Of all

irrigation districts, only a minority is served by all weather access roads so far. Even main roads are still missing on most stretches of the Juba river. Some road construction has been going on in the Lower Shabelle region lately.

3.4. Policy Issues

Very much will depend for the small-holders on the country's overall foreign trade policy. The present situation is unfavourable because most imported inputs are brought in by traders through parallel market foreign exchange and therefore at exaggerated prices, whereas the food stuffs are imported under foreign food grants at no cost. Prices for local products are still high because food aid items are a poor substitute for them in terms of quality, but prices could go down considerably if production increased. At the same time, an increase in production can be achieved only through a greater use of imported inputs, so that the present foreign trade regime would harm agriculture more than it does presently if agriculture became more productive. Clearly, it would be more fair to agriculture if all imports were treated similarly.

Much has been said and written about pricing and marketing policy lately. As we have seen above, at the moment farmers are allowed to purchase and sell on the free market. The government tolerates private traders rather than actively encouraging them, and there is no legal basis for private marketing yet. The insecurity for investors and traders connected to such a situation tends to raise marketing costs, enlarging the gap between farm gate and consumer prices. A more secure and stable system of private marketing backed by the law would probably curb speculation and provide for fairer prices.

While this is written, Somalia goes through a slow process

of change in economic policy aimed at increasing the share and the responsibility of the private sector in development, and at letting more economic decisions be taken by the market forces. It can be safely assumed that the small-holder farmers would profit if the government continued to act in this direction.

FOOTNOTES

¹ These and most of the following figures, unless otherwise stated, derive from interpolations of published and unpublished data. Reliable, consistent, and comprehensive statistics do not exist, so that authors of consultancy reports and government offices are forced to arrive at figures by "educated guesses". All figures in this paper, unless expressly assumed to be reliable, have therefore to be taken rather cautiously.

Documents used include:

- IBRD: Somalia Agricultural Sector Review, Nairobi 1981
- Somali Democratic Republic, Ministry of National Planning: Five Year Development Plan 1982 - 1986, Mogadishu 1982
- unpublished internal working papers of the Ministry of National Planning and the Ministry of Agriculture
- Central Bank of Somalia: Annual Report 1981

² Five Year Development Plan 1982 - 1986, p. 141 ff.

³ The only large scale agricultural enterprise established earlier is the SNAI sugar complex at Jowhar, launched in the 1920s.

⁴ Five Year Development Plan 1982 - 1986, p. 130

- ⁵ a) Somali Democratic Republic, Ministry of Agriculture: Genale Bulo Mererta Project, Annex III (Human Resources and Institutions) and Annex IV (Existing Agriculture), Mogadishu 1978
- b) German Agency for Technical Cooperation (GTZ): Evaluation of the Agricultural Settlement Projects Kurtun-Waarey and Sablaale and Proposals for Future Development, Eschborn 1982
- c) Farm Management Data Book, prepared by FAO-Project NECP/SOM/503, Mogadishu 1982
- ⁶ Lewis, I. M.: Land Tenure conditions, in: FAO, Somalia. Agricultural and Water Surveys, vol VI (Social and Economic Aspects of Developments), Rome 1968
- ⁷ I SoSh = 0.067 US \$
 I US \$ = 15 SoSh, in mid 1983 (official rate)
 The black market rate is about twice as high.
 I qt = I quintal = 100 kg
- ⁸ see footnote 5 (a) above.
- ⁹ Five Year Development Plan 1982 - 1986, p. 130

Costantino Faillace

APPROPRIATE TECHNOLOGY FOR THE DEVELOPMENT OF WATER
RESOURCES IN SOMALIA

Introduction

Somalia is mostly an arid country with rainfall ranging from less than 50 mm/year along the northern coast to about 600 mm in the Bay Region. Rainfall is unevenly distributed and scanty in the central and northern areas. Periodic droughts have occurred during the past decades with enormous damages to the agricultural areas and livestock. The rainy season occurs from April to June and from September to November. There are two perennial rivers, the Shabelle and the Juba, the main part of their catchments is in Ethiopia; numerous small, medium and large size temporary streams, called 'toggas', flow only in occasion of storms; the most sizeable toggas however maintain an underground flow all year-round.

In the past 30 years, several studies have been carried out for the development of the water resources in Somalia. During this period about 700 wells have been drilled by the public and private sectors in the various parts of the country. A rather comprehensive, country-wide hydrogeological study has been carried out by the United Nations' "Mineral and Ground Water Survey Project". The results of the U.N. survey are presented in the report "Ground Water in the Somali Democratic Republic", in which the country is subdivided in 16 hydrogeological provinces. The report gives information on 274 drilled wells, 1230 hand-dug wells, 261 springs, including 773 chemical analyses from these water sources. This information, together with the results of other ground water investigations carried out during the past 30 years in various areas of Somalia, is surely a valid basis for starting a water resources

development process in the framework of the Water Decade Planning. Additional studies are however needed, both on regional and local scale, for the implementation of specific projects.

The population of Somalia has been estimated at about 5.32 millions; people living in rural areas amount to 78%, about 50% of the urban population lives in Mogadishu, and the remaining urban population lives in 69 towns each having more than 5000 people.

Somalia is considered one of the least developed countries in Africa: income is less than \$ 300 per capita per annum, and it has one of the highest rates of infant mortality. Water-related diseases are recurrent and account mainly for the high rate of mortality and morbidity. There is therefore an urgent need to improve the water supply situation of the country. For the future development of the water resources it will be necessary to select those technologies which should be as simple as possible and, whenever possible, implemented with the participation and help of the local population. The scope of this paper is to describe briefly some of the technologies suitable in certain areas of Somalia which require minimum external help for maintenance and which can easily be replicated.

Financial Requirements for Developing the Water Resources

The development of water resources in a country like Somalia, where population is scattered and where distances are enormous, requires a large financial investment which nowadays can only be afforded by some of the oil-exporting countries. For the Water Decade Planning it has been estimated that the investment cost for 100% coverage of the whole Somali population with water supply and sanitation facilities by the year 1990, would amount to \$ 1400 millions. The adopted alternative for

1990 with partial coverage, amounts to S 500 millions; the recurrent costs for the sector total to about \$ 100 millions. With this large financial effort it would be possible to have a good distribution of water points to meet the needs of the population and to create indispensable conditions for the implementation of programmes and projects which may lead towards improved health conditions for people and livestock and towards economical self-sufficiency.

Almost all the required amount for achieving the decade target is expected to be provided by external aid. The recurrent costs would be funded directly by the government and through the community's participation; which should gradually be responsible for the maintenance of the water system.

Appropriate Technology for the Water Supply of the Rural Population

With a view to alleviate the pressing water needs of men and livestock, great importance has been given to ground water use in the past 30 years by drilling water wells. However, this has solved the problem only in certain areas, while for other areas it will be necessary to consider other solutions, more appropriate to local conditions.

The main reasons preventing the drilling of successful wells in large areas of Somalia are:

- the excessive salinity of ground water, which is often unsuitable for humans and livestock;
- water table, in many places, is very deep; in some cases the first water struck has between 250 and 350 meters;
- high cost of drilling and pumps;
- difficulty to maintain and operate deep wells;
- high cost of fuel consumption and for covering large distances from the centers of supply; even higher costs are required for wells drilled in areas where grazing lasts only

a few months, mainly during and soon after the rainy season;
 - shortage of skilled workers to carry out minor repairs
 directly at the well sites.

In spite of these considerations, however, drilling activities are necessary in some areas for both rural and urban populations and surely will continue to constitute one of the major burdens on the budget allocated by the Somali government in its efforts to develop the water resources of the country. For the rural water sector, deep drilling should be restricted to those areas with favourable hydrogeological conditions, with large agricultural and grazing potential and mainly where other less expensive technologies cannot be implemented. There are 5300 registered villages with a population of less than 5000 people, for 2040 villages the population ranges from 500 to 3000 people, for the remaining 3260 villages the population varies from a few people to a maximum of 500 persons; nomadic people are attached to these villages. For these rural villages the technology has to be, wherever possible, simple, low cost and replicable to new areas with the participation of the rural communities in the maintenance of their water supply. In the following pages a short description of the main appropriate technologies for the development of the water resources of the rural areas of Somalia is given.

Rain Harvesting

I. Ballehs and Wars: Two major rain water harvesting methods are practised in the rural areas using ground catchments for collecting run-off water. The first impounds water in open reservoirs called 'ballehs' and 'wars' and the second stores water in underground reservoirs called 'barkads'. Ballehs are generally natural depressions which receive run-off water from nearby land drainage; they vary in size according to topographic conditions. Ballehs are used in

Somalia from ancient times.

Traditional wars are artificial reservoirs created mainly in featureless plains to collect rain water by means of ditches. Their shape varies from square to round. The old wars were dug using primitive tools and they are, in most cases, very small in size and used for small communities. Maintenance of wars is generally done by women and children. Because of the high rate of evaporation most of these wars get dry towards the end of the dry season and the people are compelled to move close to a permanent water point or collect water from long distances using camels.

2. Barkads: Barkads are small underground reservoirs generally lined with water-proof masonry walls; each barkad impounds only the water requirement for a family or a few families. In most cases they are covered by branches and other shading devices which reduce the evaporation. A small settling basin is generally constructed close to the inlet of the barkad. A large number of barkads have been constructed by private initiative in the north-eastern regions, in areas where soil is rather porous or in places where rocks are close to the surface.
3. Modern large size water reservoirs: There are only a few available permanent usable ground water resources in many areas of the southern part of Somalia, where, to a large extent, ground water is of a poor quality, often unsuitable for people and stock. Run-off water in many of these areas is the only solution, especially in the large featureless alluvial plains of the Bay Region, the Middle Juba and the Lower Shabelle Region. In these areas some of the unreliable traditional wars have been replaced by reservoirs constructed with modern technology in the past decade. The project was financed by EEC in the early 1970s and has brought enormous benefits to the nomadic and settled people residing in an area of approximately 80.000 km². Forty

reservoirs were constructed at an approximate distance of 25 km from each other. This was considered a good distance for the grazing potential of the number of animals living in the area. The storage capacity of the reservoirs is 30.000 m³.

This large scale project, which required high investment costs, however, did not give the expected results as a series of faults appeared since its early stage of completion. Some of the major faults are reported below;

- some reservoirs were excavated not in low spots, thus resulting in insufficient inflow;
- the PVC membrane to prevent leakages was destroyed by the temperature and by the animals when they got into the reservoirs because the pumps were not working. In some cases the membranes were removed to cover huts;
- the pumps and engines were not operating in many cases;
- the hand pumps to supply through ceased to function after a relative short time;
- the embankments and ditches became in many cases silted up;
- the spillways were, in most cases, inadequate with consequent floodings of the areas surrounding the reservoirs;
- nearly 45% of the reservoirs had silting problems.

Some of the problems could have been corrected in due time if strong and well-organized maintenance units, capable to intervene with regular repairs, would have been created for this purpose. As a consequence of the damages the reservoirs suffered in less than 10 years since their construction. A "Reservoir Rehabilitation Project" is presently in progress with the financial assistance of the UN and from bilateral aids. The cost of the rehabilitation programme is estimated at \$ 3.5 millions.

The users pay for watering their stock according to the

following tariff: one SoSh per camel, 0.20 SoSh per goat or sheep, 2 SoSh for a 200 liter drum, 0.20 SoSh for a 5 liter container.

There is no participation of the users on decisions and responsibilities regarding the use and maintenance of the reservoirs.

Advantages and disadvantages of water harvesting systems

I. Advantages: The arid rangeland of Somalia is in large areas, limited more by the lack of drinking water than by lack of feed. By constructing water reservoirs in these areas it will be possible to:

- reduce the movement of livestock and consequently increase their weight;
- provide water without requiring fuel or power;
- involve the users in the maintenance of the reservoirs;
- rainharvesting reservoirs can be constructed in areas with rainfall as low as 80 - 100 mm/year if soil and topographic conditions are favourable.

2. Disadvantages:

The limiting factors of storing water in open reservoirs are the following:

- high evaporation rate between 2000 and 3000 mm/year;
- high infiltration in some areas;
- low and scattered rainfall in large areas;
- growth of algae and breeding places for insects and frogs;
- high amount of silt;
- lack of suitable natural catchments;
- unsuitable slope and soil conditions for rain harvesting.

There are however remedies for most of the disadvantages indicated above by introducing appropriate techniques such as reducing the permeability of the catchment area by spreading granular wax, which would be melted by the sun and thus seal off the granular interspaces; the use of PVC

membranes, possibly protected by gravel from radiation and wind damages. Asphalt has proved to be a good soil sealant and can be easily applied by spraying; there are also other sealants, the selection of the most appropriate ones will however depend on local conditions and economic factors. For the reduction of the evaporation and the pollution other remedies are available and could be introduced; they are described in various technical papers.

Size of rain-harvesting reservoirs suitable for Somalia

The size or type of the reservoirs will depend upon several factors including rainfall rate, land slope, grazing potential, soil conditions and evaporation. As these conditions may vary from place to place, it will be necessary to consider more than one standard size of reservoir which would fit with the local conditions.

Reservoirs, however, should not be less than 5 - 6 m deep as evaporation and infiltration loss may account for about 50%. The volume may vary from 5000 to 20.000 m³ and in exceptional cases, in areas with high rainfall and good natural drainages, higher volumes could be considered if grazing potential would justify.

Priority areas for the construction of water reservoirs have to be defined based on the water requirement of these areas as well as on the unavailability of cheaper and more suitable water sources.

However, before construction starts an investigation is required aiming to define: soil and slope conditions, form and size of the reservoir, grazing potential and other required elements. The future programme should also include an overview of existing works, in view of possible improvements by increasing the depth and extending the drainage system. The users, whenever possible, should be involved in the regular maintenance.

Development of Surface Water Resources by means of Underground Dams or other Water Holding Structures

Of the two rivers of Somalia, one, the Juba, is considered to be perennial while the Shabelle is usually dry 2 - 3 months a year.

Besides these two major watercourses, Somalia could exploit a good number of temporary streams which are dry almost all the time, except in flood periods. During the floods, considerable volumes of water flow down their beds, which, if retained, could constitute a very important and cheap source of water for many areas which presently suffer an acute shortage of water.

At some depth below their bed, sometimes even at the end of the dry period, one can find water, which, however, is scarcely and inefficiently used by the local populations. Among the streams which appear worthy of consideration we may mention Uadi Giael in the Daror Valley, Uadi Nogal and its tributaries in the Nogal Valley, the tributaries of Shabelle in Hiran, the major uadis in the Bur Zone (particularly the uadi traversing Bur Acaba and Uadi Matagoi, which has a remarkably long course) and the many tributaries of the Juba in both Upper and Lower Juba. Investigations should be undertaken as to the possibility of constructing barrages.

Suitable Areas for the Construction of Water Reservoirs

The most promising areas for the construction of small, water-holding structures are the Bari Region, the northern regions, the Hiran Region, the Bay Region, and the Gedo Region.

In these regions, due to lack of reliable water supply available all year round, the population is at present scantily distributed during the dry seasons, but increases during the rainy season, when livestock finds good grazing and water conditions.

The selection of the most suitable temporary streams to be dammed should take into account the following factors:

- favourable geological conditions;
- dependable rainfall;
- grazing and/or irrigable land potential.

Numerous dry streams however, present geological and morphological conditions favourable to water storage either in open reservoirs by constructing small earth or concrete dams, or in sand reservoirs by means of sand storage dams or underground dams.

Investigation of Selected Sites for Dam Construction

The development of the areas where dams could be constructed has to be in accordance with the ascertained farming and grazing potential and the identification of the target group capable of carrying out the agricultural or animal husbandry activities in the selected areas.

In general, three types of dams could be considered. Small surface dams could be constructed in the headwater of the 'toggas'; they would be used to store water which during the dry season would be released to recharge the downstream sand reservoirs. Sand storage dams could be built in the middle section of the 'toggas' so as to trap sand and gravel during flood waters. The sand storage dams have to be constructed in stages; therefore a study on the amount of materials transported during spate flows is indispensable. Underground dams could be built across the lower reaches of the 'toggas' so as to stop the underground flow and store water during spate flows in the coarse, permeable sand and gravel which fill their beds. Hand-dug wells and infiltration galleries could be constructed to tap the water stored in these 'togga' beds. The main activities of the investigation programme are as follows:

- to study the characteristics of the selected catchments and

- define the rainfall/run-off relation;
- to study the geology of the basins and of the potential dam sections;
- to carry out geophysical works, exploratory drillings and pits in order to check the physical characteristics of the alluvial deposits and of the underlying rocks;
- to carry out topographical surveys and define the storage capacity of the reservoirs;
- to locate building materials and decide on the most economical type of dams;
- to construct small sand storage dams and underground dams for field testing;
- to carry out socio-economic studies of the area and to consider the effects deriving from the water sources;
- to prepare a report on the activities and results of these investigations including all the technical data of the proposed dams. The report should also include the financial and socio-economic aspects.

Dam Construction

The design of type(s) of dams to be constructed, including all the technical details and costs involved, is part of the investigation phase; in this follow-up phase, however, a detailed investigation of the selected sites should be carried out before starting the construction of the dams.

Shallow Aquifer Development

Ground water from shallow aquifers can be exploited by hand-dug wells, infiltration galleries, driven wells and shallow drilled wells.

Hand-dug wells

Experience in many developing countries has demonstrated that, whenever possible, shallow hand-dug wells, probably designed

and constructed, should be preferred to deep drilled wells because

- their cost is much lower;
- they can be constructed in aquifers with lower yield since they have a certain storage capacity and the removed amount of water can be replenished during the night and when the well is not in use;
- maintenance cost is minimal compared to that of deep wells since the water can be drawn by hand-pumps, windmills and other low-cost means;
- the implementation of a shallow well construction programme is justified also by economic reasons deriving from the benefits of the improved health conditions of the population and because the distance from the present distribution of water points would be shortened; this would also consequently benefit the livestock. Local communities could contribute with local materials and labor.

In view of the above, much more importance should be given in Somalia to the construction of new shallow wells, wherever this is possible, and to the improvement of existing ones.

Rehabilitation of old hand-dug wells

No precise statement can be made as to the number of open wells, both seasonable and perennial, existing in Somalia, but there are estimated to be over 2000. Their depth and capacity varies greatly according to climatic and geological conditions.

Many of them were built centuries ago, as is the case in the Baidoa region, and present many shortcomings due to the lack of maintenance; some of them are partially silted up. These open wells have, oftentimes, very large orifices and consequently present a threat to causalities. In most cases they are unlined and unprotected; small animals, insects, dead leaves, and dust have easy access into them. Wells dug in

depressions are more prone to heavy pollution, because during the rainy season the run-off water brings abundant animal excreta from the surrounding areas into these wells. Pollution is brought into the wells also by wind and skin buckets which are generally used to draw water.

Due to the above conditions, hand-dug wells represent a serious hazard to the health of the people and livestock. If these wells were properly constructed and protected, they could be of great benefit to the country.

Suitable areas for the construction and rehabilitation of hand dug wells

The selection of a hand-dug well location is based on the possibility of finding water of good quality and substantial quantity at shallow depths which can be used by people and livestock.

Compared to the size of the country, the zones offering favourable conditions for the construction of hand-dug wells are rather limited. The most promising are the following:

- Coastal Dune Belt. It follows the contours of the Somali peninsula. The best conditions for manual excavation of wells are from 1 - 20 m above sea level. Water quality varies from very satisfactory to unsuitable for people and livestock;
 - Sand River Beds and Alluvial Belts. Numerous large temporary streams, 'toggas', incide the northern regions, Bari Region, Hiran Region, Bay Region and Gedo Region. Among the major streams are the Wadi Giael in the Daror Valley, the Wadi Nogal and its tributaries in the Nogal Valley, the tributaries of the Shabelle in Hiran, the major Wadis in the Bur zone and the many tributaries of the Juba in its upper and lower parts.
- These streams maintain, all year round, an underground flow

in their sandy beds which is scarcely and inefficiently used by the local population.

In many cases, hand-dug wells in the alluvial belts of these 'toggas' could increase their yield if connected by infiltration galleries to be constructed across sandy beds;

- Juba and Shabelle Alluvial River Belt. Along the alluvial belt bordering these two rivers for a width averaging on either bank about 5 km the conditions are favourable for the construction of shallow wells. However, the conditions regarding the depth of the aquifer vary greatly from place to place. Water quality varies from good to unsuitable for people and livestock;
- Erigavo Plateau. Numerous hand-dug wells and karstic sink-holes are presently supplying people and livestock in the area. Conditions are favourable for digging shallow wells in this area. However, a hand-dug well rehabilitation programme should have priority since the existing wells are all heavily polluted by animal dung brought into the wells by wind and run-off surface water. Most of these wells are located in karstic depressions, and water quality varies from fair to bitter in taste due to the sulphates;
- Scattered Areas in Mudugh and Galgudug Region. Some areas of these two regions are covered by limestone formation affected by karstic phenomenon which have created small depressions and cavities. These phenomena are at times limited to the surface because of underlying strata of clay and marl which form perched water bodies. Wells in these zones are mostly perennial and provide water of good quality.

The most extensive zones are: Ghelinsor, Merengur, Sindago, El Dere, El Bur, Dirri, Bud Bud, and the zone from Galcaio to 50 km inland from Obbia. Other zones are also promising but less extensive;

- Area along the Disputed Border between Fer-Fer and Dolo. Shallow aquifers of the perched water type exist along a large belt between Fer-Fer and Dolo. Water has slightly bitter taste due to the presence of sulphates; however, the total salt content is not excessive and the water is accepted by the people and livestock. The hygienic conditions of these shallow water wells are extremely poor because most of these wells are located in karstic depressions and thus are heavily polluted.

Institutional support for the Implementation of a hand-dug well programme

At present no governmental institution is carrying out hand-dug well programmes in the country. In the past, mainly in the late 1950s and early 1960s, a successful hand-dug well programme was implemented by the public administration. At the level of private initiative, hand-dug wells are presently constructed in Mogadishu as well as in other parts of the country. The implementation of a nation-wide hand-dug well programme requires technical and financial support from the government.

The Water Development Agency (WDA) is the most qualified organization for carrying out such a programme because, apart of the Drilling Department, it has also the Hydrogeological Department and the Engineering Department which could well be involved in this programme.

Furthermore, the 16 regional WDA offices could help during the construction operation and later on with the maintenance of the works. The hand-dug well programme should be carried out in collaboration with the Ministry of Local Government and the Rangeland Agency which should indicate their priorities of both the rehabilitation and construction of these wells in suitable areas.

Community Participation

Experience has demonstrated in many countries, that the most successful projects are those which have been implemented using simple and low-cost techniques with the help of the local communities.

In Somalia a large number of hand-dug wells have been constructed without external help in most cases, and there are numerous well-diggers who have reached a good skill in this work. The communities' motivation to help and support the programme will be a guarantee for the maintenance of their own water wells once they are aware of the danger of polluted water to health.

The community participation should consist in labour and locally available materials (sand, clay and rock).

Project Implementation

The project should be implemented in various phases. The first phase, of a two years' duration, should be restricted to the selection and rehabilitation of 100 existing hand-dug wells, with the scope of cleaning, lining and protecting them from external pollution; some wells should be equipped with hand pumps or windmills.

One of the main tasks of this phase however, should consist in the organization of the programme which should include the training of personnel, the purchase of equipment, the collection of materials, the manufacturing of concrete rings, etc. For gaining a comprehensive, country-wide preliminary experience on the various techniques to be used during the first phase and for the preparation of an expanded activity in the follow-up phase, it will be necessary to develop the programme in different geographical and geological conditions.

The choice of the appropriate technology for the rehabilitation well programme, as well as for the construction of new

wells, may depend mainly on economical and technical factors and on the geological conditions. Lining will be made with concrete rings or masonry works or with any other suitable and appropriate material according to local conditions. The number of people who could benefit from the first phase of the programme may depend on several factors including the depth of the well, the distance from the well to the users, the size of the village and other factors including rainfall occurrence, habits of the people in their water needs, etc.

Experience in other African countries shows that a village supply well, equipped with a hand pump, could, in normal conditions, supply between 250 and 300 people with 20 liters of water per day. In case of pressing water need, the number of people per well can be doubled.

From the above, it is estimated that under normal circumstances, between 25.000 and 30.000 people could benefit from having an improved water supply in the first phase of the programme.

Development of Spring Water

More than 250 springs have been inventoried in Somalia, but its number may well be over 300. Most of them are located on the slopes of the northern mountains; some springs have been located also in the Mudugh, Hiran and Bay regions. Their utilization is negligible as most of the water disappears, in many cases, after a few meters from the source in boulders and gravel filling the beds of water courses.

Spring water could be piped to areas with good grazing and agricultural potential. At present only a very minor amount of water from this valuable source is used for agriculture, mainly for date cultivation and for watering stock. A project

aiming to develop this interesting and promising cheap water, which in many cases can be brought to users by gravity, is highly recommended. The first selection of the most interesting springs could be done from the existing inventory carried out by the UN Mineral and Groundwater Project. Additional information however is required on their regime before planning their exploitation.

Conclusions and Recommendations

1. In spite of the fact that Somalia is mostly an arid county, conditions are, in many cases, favourable for the development of its scarce surface and shallow ground water resources by means of appropriate and low-cost technology.
2. Deep drilled wells, which are very costly to construct and to maintain, should be restricted to large villages and urban towns having favourable hydrogeological conditions. For the rural sector, deep drilling is justified only in areas with large agricultural and grazing potential and where conditions are not favourable for cheaper technologies.
3. The traditional small reservoirs, 'wars', are, in most cases, unreliable because they may dry up during prolonged droughts. The rehabilitation of traditional wars by proper deepening and lining to reduce infiltration and evaporation will assure permanent water supply and thus prevent people from abandoning villages and grazing areas during the dry months.
4. Barkads have proven to be valuable small sources of water for many small settlements, especially in some of the northern regions. Most of them have been constructed by the private sector. This method of storing water could be

- improved and introduced in other areas of Somalia.
5. Modern large-size reservoirs have proven to be very expensive and require an efficient organization for their construction and maintenance. Reservoirs varying in volume from 5000 to 20.000 m³ appear to be more appropriate to the conditions of Somalia.
 6. Conditions are favourable in large areas for the implementation of a successful hand-dug well rehabilitation and construction programme. The most important areas are the coastal dune belt, the main sand river beds and their alluvial plains, the Erigavo Plateau, some areas in the Mudugh and Galgudug regions, along the disputed border between Fer-Fer and Dolo.
 7. Sanitary conditions of wars, ballehs, barkads and hand-dug wells are generally very poor mainly because they are unprotected from pollution. As people are little aware of the dangers of water-related diseases, a strong village health programme is required.
 8. Conditions are favourable for developing surface and sand storage water reservoirs by means of surface and underground dams with consequent benefits for large areas which presently suffer from an acute shortage of water. Numerous small dams could be constructed in the Bari Region, the northern regions, the Hiran Region, the Bay Region and the Gedo Region. In many cases, small surface dams for storing water in open reservoirs could be constructed in the headwater of the major toggas, sand storage dams could be built in their middle sections and underground dams could be constructed across their lower reaches. Water stored in sand reservoirs would then be tapped by hand-dug wells and infiltration galleries.

9. It is estimated that there are well over 300 natural springs in Somalia; their utilization is however negligible as in many cases most of the water disappears in boulders and gravel at short distances from the source. In some cases spring water is presently used for the irrigation of small plots and for watering stocks. A better utilization of this cheap, valuable water source could bring considerable benefits to numerous settlements and to nomadic people. The selection and study of the most important springs is highly recommended.
10. The Water Development Agency is presently engaged in drilling deep water wells for rural areas and urban towns. There is a need to strengthen its technical capability, in order to expand its activity and to satisfy the water needs of the country, developing appropriate, and, wherever possible, low-cost technologies.
- II. A Water Resources Development Master Plan for the whole country is required and should be prepared as soon as possible; effort should be made to obtain financial aid from international organizations and donor agencies for this purpose.

R. Pozzi / G. Benvenuti / G. Gatti / Ibrahim Mahamed Farah

WATER SUPPLY AND AGRICULTURAL USE : A PROPOSAL FOR
THE ADOPTION OF SUBSURFACE DAMS IN SOMALIA

Introduction

Subsurface or underground dams have proved to be useful as barrages of the underground water flow in the subsurface of temporarily present water courses in order to set up, or increase, permanent water reserves during floods. In other words, it is a matter of creating impermeable diaphragms within loose porous materials with sufficient permeability down to a bed-rock of lesser permeability, or even an impervious one.

The seepage or infiltration waters saturate the porous material until an underground water reserve is built up which will not, therefore, be subject to evaporation. A similar method and the relevant techniques were first used on a relatively large scale, in recent years, in arid and semi-arid countries; however, owing to the general increase of water consumption in all industrialized and densely populated countries, the necessity has arisen to store water, for instance during the spring season when water is usually available in excess of consumption, in order to satisfy the various consumption peaks (projects to this target in the executive stage are at hand from Japan, the USA, and elsewhere).

Other obvious developments have been registered as regards the convenience of these works: in fact, the issue is no longer confined to preserving water against evaporation, but also, and far more, of not encumbering with an open air water tanks inhabited or not inhabited areas.

Geo-Engineering and Hydrogeologic Prerequisites for the Design of Subsurface Dams

The experience gained in Algeria suggested to A. Robaux (1954) the following classification of works relevant to subsurface dams:

- underground barrages deviating the flow of seepage waters below ground level, channeling them toward consumer areas;
- underground water storage barrages raising the level of the aquifer, thus creating a zone of humid ground for the direct development of suitable kinds of crops;
- underground water storage barrages with captation works of the water reserve thus accumulated - the true subsurface dams.

Obviously underground barrages of this nature will in any case permit to use the water downstream, provided the barrage is complete with captation works, as well as upstream if pumping stations can be installed, or even locally, if the saturated ground is sufficiently close to the surface.

The engineering and hydrogeologic prerequisites warranting the feasibility of subsurface dams are essentially based on the availability of:

- an impervious bed-rock at reasonable depth, if possible with a lie shaped like a buried basin (syncline);
- a porous reservoir (sands, gravel and intermediate lithotypes) of adequate volume for building up a permanent water reserve, capable of lasting two years without the need for natural recharge (so as to take into account cases of exceptional drought);
- a very ample intake basin to compensate scarcity of annual rainfalls;
- a water course - even of the seasonal kind - collecting any and all precipitations, both intensive and of short duration, in certain regions; seepage may be accentuated by means of bridles and/or cross beams slowing down the

outflow.

The first methodological exposé of the more widely used procedures in constructing underground diaphragms is due to R. Tornaghi (1969), and contemplates:

- injection screens;
- tangent or secant poles sunk or cast in situ;
- panels cast in situ following ground removal;
- secant panels or panels placed into 'stabilized soil';
- thin diaphragms cast in situ with the aid of metal angles.

To be added to these are the 'coil-element' diaphragms (ICOS S.p.A., Milan 1967) and the 'plastic' diaphragms (Rodio S.p.A., 1977).

The former is particularly suited in the presence of relatively strong subsurface aquifer currents for instance at contact between flooding waters and bed-rock, or when one can safely assume the presence of large erratics, difficult to be crossed by standard means. The use of this type of pole also provides an excellent seal between the alluvial porous lithozone and the impervious bed-rock, particularly if the latter consists of crystalline schist which is difficult to be injected. From a technical viewpoint, the contact between the porous reservoir and bed-rock is certainly the most arduous task of diaphragm performance.

In one of the examples mentioned above (ICOS) the rock was located at a depth of about 30 m, with a downstream inclination of about 20°; at the maximum excavation depths, therefore, water pressure against the diaphragms reached 2-3 atm. The use of a 'coil-element' diaphragm permitted the setting up of a pumping station within the range of one ENEL's hydroelectric power plants in Italy. Even using some of the more conventional diaphragms, ICOS has been in a position to construct subsurface barrages specifically designed to raise the level of the aquifer so as to facilitate the exploitation of the available groundwaters. As far as depth is concerned, there appears to be considerable scope

for the use of ICOS diaphragms, since there are examples of blocked river beds in the presence of bed-rock at a depth of 100 m; on the other hand, Bentonite, used in making the diaphragm, produces a lasting effect even after it is removed from the borehole, thus increasing wall impermeability.

While the traditional technology still retains its validity, the past ten years have witnessed the development of plastic diaphragms, using 'self-hardening' muds. These muds (the so-called 'plastic mixtures') are introduced directly on excavation and initially act as drilling fluids, to assume later the required characteristics of strength and deformability.

This has permitted the construction of continuous jointless structures combining excavation and casting into a sole operation, in theory with saving of time and costs.

The mud components most commonly used are cement and Bentonite, which may, in certain cases, be replaced by sufficiently plastic types of clay.

The binder may consist in a cement/pozzolana mixture, provided the lesser cost of the latter component makes for overall savings without prejudice to the desired short or long term results; it may also be necessary to use chemical additives.

For waterproof diaphragms the composition of the self-hardening is generally kept within the following limits:

Bentonite/water: 0.04 - 0.07

Cement / water : 0.15 - 0.30

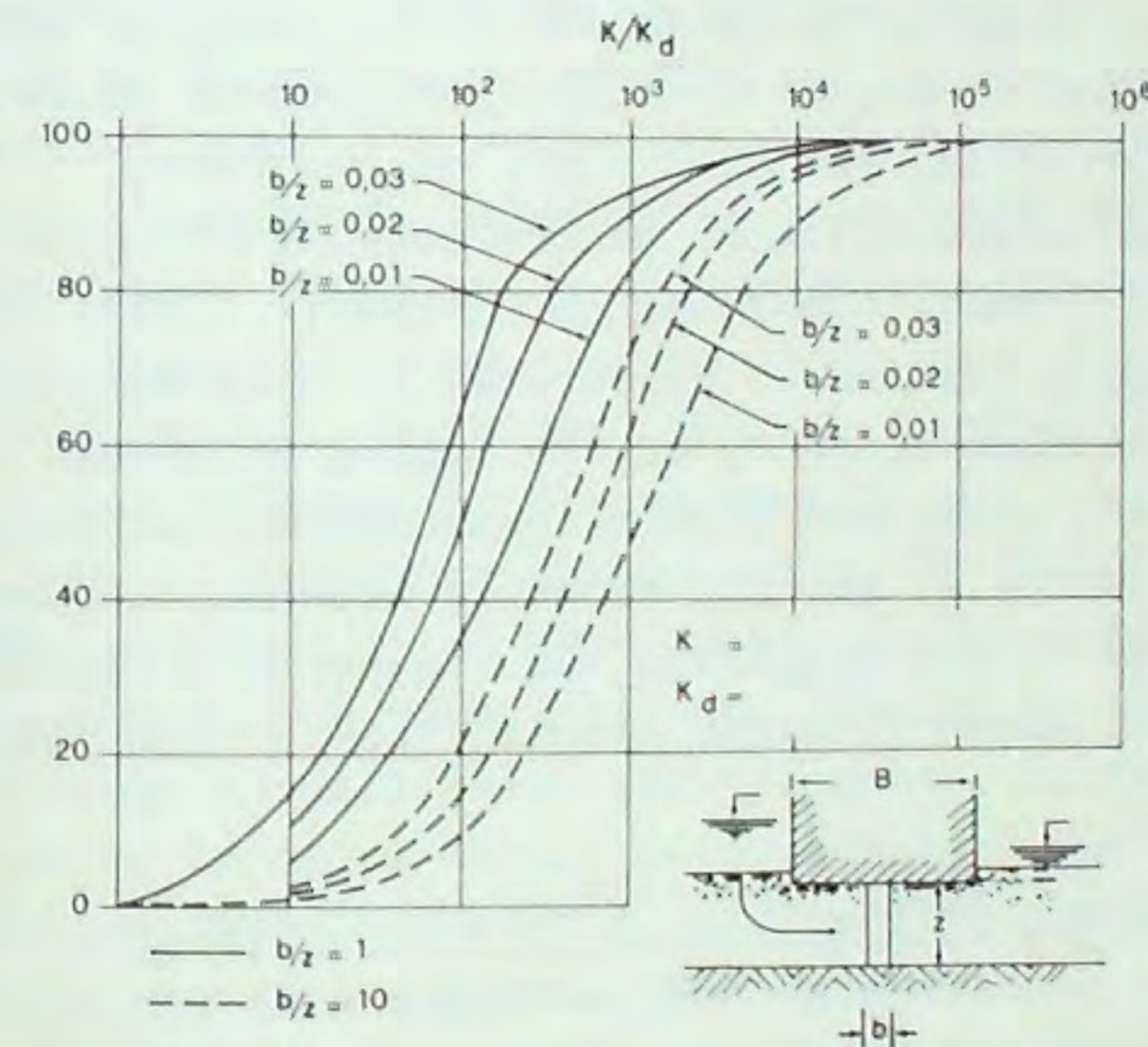
For applications requiring greater final resistance the cement/water ratio may be increased considerably. The typical permeability of a plastic diaphragm is in the order of $K = 1 \times 10^{-6}$ cm/sec, at the stage when the mud retains its plasticity; this value decreases to values of the order of $K = 1 \times 10^{-9}$ cm/sec as soon as the mixture hardens. According to measurements taken, this permeability value will last

even for years after construction.

According to Ambrasey (1963) the efficiency of a continuous diaphragm set into a waterproof substratum is expressed as a percentage ratio between the residual capacity ($Q_0 - Q$) and the filtering discharge Q_0 in case of free flow (see figure I):

$$E = 100 (Q_0 - Q) / Q \text{ in } \%$$

Figure I. Efficiency of a continuous diaphragm, expressed as residue discharge in relation to the filtering capacity without diaphragm (Ambrasey 1963).



- K = permeability coefficient of the ground in relation to the diaphragm set into an impervious substratum
- b = diaphragm thickness
- z = diaphragm depth
- B = width of work protected by diaphragm (horizontal extension corresponding to piezometrical difference in height upstream and downstream)

On the basis of laboratory tests and checks in situ the stability of self-hardening muds can be considered as complete even in the presence of waters that are sulphurous, acid or even rich in selenite. Lastly, as concerns their long-term behaviour, there may be a risk of erosion and/or corrosion by underground waters in case of elevated seepage velocity. This risk tends to increase where the bed-rock does not possess a high degree of impermeability; in such an event, it should be considered that a greater injectability of the substratum will bring about an improvement in general sealing conditions. In certain regions, however, the presence of aggressive waters in areas of contact between diaphragm and bed-rock may cause corrosion problems, which, however, seem to decrease due to the lack of sensitivity peculiar to Bentonite-stabilized cement in respect of any agent attacking standard types of concrete.

A diaphragm can obviously also be realized by means of clay block within a trench: according to Ambraseys (1963), diaphragm efficiency (E) can be calculated in this case by assuming an infinite tendency of the number of cracks and by replacing the ratio W/D ("open space ratio") or degrees of imperfection - i.e. the relationship between the overall cracked surface of the diaphragm and its total surface - by the ratio K_I/K , where K is the permeability of the clay blocks. Then:

$$E = \frac{100/I (K/K_I - I)/D}{B/D + I (K/K_I - I)/d + 0.83} \quad \text{in \%}$$

B/D being the ratio between the width of barrage above the diaphragm (B) and the stratum to be diaphragmed, which is supposed to equal the diaphragm length.

Sealing diaphragms may also be manufactured according to a methodology recently developed in Japan and presented by G. Miki in 1973 at the 8th ICSMFD in Moscow. The process,

called "Chemical Churning Pile or Pattern (CCP)", consists in introducing into the ground mixtures of cement, or cement plus silicate, by means of an injector placed at the lower end of a boring rod 40 - 60 mm in diameter. The injection fluid is pumped in at overpressure - the 200 - 250 kg/cm² standard operating pressure may even rise to 600 kg/cm² in certain instances - causing the ground to split at the sides and to mix with the injected product. Thus there will be formed consolidated columns 40 - 50 cm in diameter, which, partially superposed, will result in continuous impervious walls.

The importance of a complete diaphragm system with a particularly tight fit in the contact zone between the man-made structure and the bed-rock is clearly evident. A previous paper by R. Pozzi and G. Benvenuti ("Applied geological and geophysical study for subsurface dams in the Nugal Valley (Northern Somalia)", Padua 1979) underlined the theoretical considerations determining this problem: the zones investigated were located in a hardship area from a logistic and environmental viewpoint, therefore quite different considerations relevant to the economical use of one or the other type of diaphragm should apply. It appears obvious that the manufacture of more sophisticated diaphragms should require better and more efficient job-sites: this may involve considerable difficulties. Lack of water, or the widespread presence of brackish water, represent only one of such possible negative aspects, not to mention the difficulty of procuring the necessary raw materials (cement, Bentonite and/or clay) and purely logistic problems. It may well be that earthworks followed by tamping of a clay block prove reasonably convenient after all.

Ground investigations involve the identification of a buried synclinal rock structure with a permeability coefficient between $10^{-5}/10^{-7}$ cm/sec, not affected by important dis-

locations. This identification will obviously start from considerations concerning the regional geologic characteristics and take shape by means of detailed geological surveys, first and foremost by establishing a plan of field surveys of a geophysical mechanical and engineering nature, aimed at defining:

- the lie and form of the impervious substratum;
- the composition and thickness of the porous reservoir, so as to determine the physical and hydraulic characteristics of the future aquifer;
- the presence of clay deposits used for making diaphragms and the possible digging of tube or dug wells.

An additional purpose of geognostic drilling is to equip small diameter pilot wells not only for direct permeability measurements, but also to measure any aquifer currents within the contact zone. A useful tool could be the micrometer currently adopted by Rodio S.p.A. and described by them as suitable to assess natural flow speeds of under 1 cm/sec, and conveniently lowered into 50 mm boreholes. In fact, as underlined earlier in this paper, when making a technical choice as to the type of diaphragm to be adopted, it is important to assess the hydrogeological and hydraulic conditions prevailing at the bottom of the reservoir. As to the latter, one should evaluate not only its geometrical dimensions, but also its effective porosity, in order to calculate at once the feasible volume of water storage and the necessary saturation time; the time factor will obviously depend on the amount and distribution of rainfall. As concerns effective porosity, it should further be noted that on the whole a value varying between 10% and 20% of overall porosity is more or less acceptable; permeability tests in situ accompanied by drillings, all carried out according to the appropriate procedures and methods, have

long become a standard practice.

It has been said that the use of a good type of colloidal clay instead of Bentonite is feasible for self-hardening muds.

This circumstance could be of considerable economic importance, since Bentonite is generally very expensive, its price being four times the price of cement in certain countries. On the other hand, there are practically, very reduced possibilities to discover clay deposits having crystalline particles with a diameter below 0.002 mm and consisting mostly of Montmorillonite, not to speak of the unlikelihood that such deposits are sufficiently close to the place of application.

As can be seen, economic considerations are closely linked to the strictly technical aspects, particularly so in arid or semi-arid countries where there is a particular need to adopt this type of solution to create permanent water reserves, the benefits of which are self-evident.

Geophysical surveys for choice of site and subsurface dam projects

Knowledge of the structural, lithological and geotechnical features of the underground is of basic importance in determining the feasibility of major civil engineering works, as well as in determining the most suitable technical solutions and evaluating their ultimate cost.

A considerable part of such studies is taken up by geognostic perforations and laboratory tests on rock samples collected during such operations. Perforations or soil drillings are useful in that they permit direct explorations of the subsoil; however, the disadvantage lies in their high cost and in the spot collection of data. To overcome these difficulties, geophysical investigation is being in-

creasingly used, as it permits indirect subsoil exploration at a far lower cost over a far more extended area; in fact, the data so collected in a certain sense provide an average picture of the subsoil around the point of measurements.

More specifically, when designing subsurface dams a geophysical survey will prove very useful in solving two kinds of problems of equal importance in ensuring a good product quality:

- evaluation of the hydrogeological proprieties (physical and hydraulic) of the subsoil with special regard to their horizontal and vertical variations;
- determination of morphology of impermeable bed-rock. So it is possible to point out the more favourable thickness of rock reservoirs and the site where placing the sub-surface dam.

Generally speaking, a geophysicist can tackle problems of this nature by resorting to two methods of investigation, namely geo-electrical sounding and seismic refraction surveying, each within its own optimal range of application; their joint use, which is not always possible for technical and financial reasons, ensures a high degree of precision and reliability at the stage of geophysical interpretation.

The first method relies on measuring electrical ground resistivity at increasing depths; it will be the more efficient, the greater the contrast of the resistivity characteristics for each type of ground. The method has quite a good resolutive capacity, permitting the detection of strata with thickness equalling at least the relevant tectonic depth with an appreciable degree of precision. It is particularly suitable when evaluating the water-bearing characteristics of the alluvial deposits.

For these deposits the value of electrical resistivity is, in fact, inversely proportional to their content of super-

fine elements, this practically to their permeability. A resistivity scale " " is tentatively set forth below:

- $\rho < 10$ ohm.m: prevalence of clays
- $10 < \rho < 20$ ohm.m: prevalence of silt clays
- $30 < \rho < 40$ ohm.m: prevalence of silt
- $60 < \rho < 80$ ohm.m: prevalence of sands
- $\rho < 80$ ohm.m: prevalence of gravel

The seismic method for studies related to problems of civil engineering is the method of refraction based on the varying propagation speeds of the elastic waves in the rocks, such speed depending essentially on the elastic features of the material. The method features a considerably higher resolutive capacity than the electrical one compared with which it is however less incisive when detecting the hydrogeological aspects of loose alluvial soil. Vice versa, the method is particularly suited for determining both the depth and conditions of the rock forming the aquifer bed on which the barrage works are to be anchored. There is, in fact, a neat contrast of the propagation speed not only between alluvial deposits and compact deposits (bed-rock in sensu lato), but between rocks with different degrees of alteration or jointing as well. This method of investigation will therefore be particularly useful where altering and/or tectonizing processes have involved the bottom rocks, causing a radical change of their physical and at times, even petrographical features. A typical example is given by the sub-surface barrages which are to be built in those zones in which the bed-rock is made of magmatic or metamorphic rock in general and of granite in particular; a sequence of altered rock belt, a belt of jointed rock and lastly, compact rock can usually be found justly beneath the alluvials, the bed of the more

important aquifer. Wanting to realize a truly efficient type of work in similar circumstances, cognizance of the importance of both belts as to thickness, extension and degree of compactness should obviously be of considerable interest.

Similar data can be given by seismic studies considering that the typical speed of propagation in sound rock is reduced to $1/5$, to $1/4$ in the belt of alteration and to $1/3$, $1/2$ in the fractured belt according to the importance of alteration and fracturation.

Geotechnical problem during the design of sub-surface dams

The geotechnical problems arising in the design stage of sub-surface dams with the aid of impervious diaphragms are mainly concerned with the hydraulic and static checks. The hydraulic check contemplated an evaluation of the syphoning safety coefficient and a calculation forecast on the delivery of water which may seep in beneath the diaphragm. In many cases the application of approximate methods such as tracing the grid of seepage, can lead to sufficiently accurate evaluations once the type of deposit permeability in question and the aquifer geometry have been defined.

Analytical and final solutions are possible solely in those cases in which the geometry and contour conditions are sufficiently simple and flow-governing equations are linear.

Whenever particularly complex conditions are met, the use of numerical methods becomes absolutely necessary; the construction of models to which one resorts at times, becomes quite a burden, quite besides the hardly acceptable time requirements.

The used numerical methods are mainly those based on finite

differences and finite elements even though other methods are employed at times like those of the characteristics and integral equations (C.S. Desai "Flow through porous media", in: Numerical methods in geotechnical engineering, 1977).

The static control which is not indispensable in cases without strongly unbalanced loads at the two diaphragm faces, accentuated stratigraphical heterogeneity will be required in particular circumstances such as levelling and embanking operations near diaphragms, elevated hydraulic loads, presence of soft strata and unfavourable morphologies. Such checks should concern both the overall stability of ground and diaphragm as a whole and the definition of deformation and action taking place inside the diaphragm.

Whilst a control of the overall stability may be carried out by traditional methods of calculation, research of the state of tension and deformation within the diaphragm becomes difficult and little accurate.

In many cases the problem will be faced considering the diaphragm like a beam rammed into the ground and subject to external stress and action by the ground.

As no closed-form solution is possible, recourse is made to discerning solutions applying the method of the finite differences or the method of Zemochkin and using for the ground the Winkler model with springs of rigidity variable according to depth and stratigraphy (elastic or elasto-plastic type).

The major difficulties are, however, not of a mathematical nature, but consist far more in evaluating the action brought to bear on the diaphragm and the definition of a link in harmony with ground reaction-diaphragm displacement; especially the latter aspect of the problem has apparently not been solved yet.

The analysis of the behaviour of sealing diaphragms cannot

be conducted satisfactorily except for the use of the finite elements, particularly when diaphragms are involved in excavations or embankments (G. Gatti / A. Cividini "Stato di tensione e di deformazione in un diaframma plastico e nel terreno interessato da uno scavo profondo in presenza d'acqua", in press).

For a description of the non-linear behaviour of the ground the hyperbolic link type, proposed by Duncan and Chan (see the ISBILD Programme) is frequently adopted. However, in presence of a condition near to failure similar schematics lose efficiency (see Ozawa and Duncan "Elasto-plastic finite element analysis of sand deformation", 1976); it will then be preferable to resort to an elasto-plastic model (see Gioda / de Donato "Elastic-plastic analysis of geotechnical problems by mathematical programming", in: Int. Journal for numerical and analytical methods in Geomechanics, 1979) defined by the elasticity module E and the coefficient of Poisson μ for states of stress contained inside or pertaining to the failure envelope of Mohr-Coulomb.

Referring to a plane in deformations ($\epsilon_y = 0$), the failure envelope of Mohr-Coulomb in function of σ_x , σ_z , and σ_{xz} (supposing tension $\sigma_y = \sigma_2$ being intermediate in respect of the main tensions σ_1 , and σ_3 on plane X, Z) will have the form:

$$(I) \quad (\sigma_x - \sigma_z)^2 + \tau_{xz}^2 = (2c \cos\phi + (\sigma_x + \sigma_z) \sin\phi)^2$$

Within the range of tensions σ_x , σ_z , and τ_{xz} the equation (I) represents an elliptical section cone the axis of which coinciding with the straight line

$$\tau_{xz} = 0, \sigma_x = \sigma_z$$

For stress conditions appurtenant to the yield surface the plastic and increasing deformations may be expressed, according to the Law of Normality, by the following:

$$\epsilon_{p_{ij}} = \lambda \frac{\delta f}{\delta \sigma_{ij}}$$

in which λ is a plastic multiplier and f the yield function of equation (I).

Calculating by finite elements also creates considerable difficulties which will become the more relevant the greater the complexity of the supposed ground model and the higher the number of elements in play. It will therefore become necessary to provide for an appropriate limitation of the area of discernment both upstream and downstream of the diaphragm, as well as in depth.

Certain indications regarding the dimensions to be adopted are given by F.H. Kulhawy ("Embankments and excavations", in: Numerical Methods in Geotechnical Engineering, 1977).

The module evaluation requires particular attention as its value changes in function of the state of tension. Depending on the required degree of accuracy one may refer to modules corresponding to the initial and final situation or with better results even, associate the module variation with the state of stress.

Nugal Valley: Hypothesis on interventions in favour of zootechnics

We regarded useful putting before some constructive and methodological considerations about construction of sub-surface dams; very little notes were published on this subject, although many specialized in subsoil works enterprises boast a long professional experience, obviously

inedited.

In Somalia studies for groundwater reservoirs were made (even by preliminary investigation-drillings) in ex-Somali-land by J. A. Hunt ("Sub-surface Dams in Hargeisa", October 1954/May 1955) who did work excellently.

Hypothesis on interventions in Somalia were pointed out also by C. Faillace in the 1960s. C. Faillace must be considered the most expert in Somali problems. Between 1982 and 1983 he proposed many projects to the Somali government.

We want to take again the notices published in 1978/1979 about sub-surface dams in Nugal Valley (between Garoowe and Sinujiif), adding some unpublished data collected in Togga Nugal in Eyl area, thanks to the field investigations made by R. Pozzi, E. Somavilla, Saadia Arif Osaim, Ibrahim Mohamed Farah in 1979 and 1980, later by R. Pozzi and G. Benvenuti, and again by R. Pozzi and Ibrahim Mohamed Farah. Here it is the reason: about discharges of Togga Nugal to the north of Eyl we have only approximate informations. Perhaps there are some, but dispersed in quite private reports, being always difficult to consult and to be found. Our own goal concerns the remarkable possibilities that Nugal Valley gives for cattle-breeding, also considering the abundance of fresh-water localized in some sectors not interested by evaporites (gypsum and anhydrites).

Researches in Sinujiif territory

Sinujiif village is situated about 60 km far from Garoowe in the wide talweg of Nugal. The river-bed of Togga is lowered of about 2 m as regards the site on which the built-up areas lies, and is about 200 m large. The sandy-gravel alluvium has $5,3 \cdot 10^{-2}$ cm/sec permeability and constitutes a site for a remarkable sub-surface unconfined aquifer.

This aquifer is occasionally overworked; mostly people dig by hand little wells in the sub-surface, which are utilized temporarily either for man or for cattle (all the valley is rich in it). We must observe that the geophysical researches, even if limited, have pointed out that reservoir rock has a remarkable thickness and in this way we have a real possibility of tube wells which permit a continuous irrigation.

In April 1979 the static level was considerably lowered; dug wells were few and about 1,30 m deep; the water temperature was of 28° C, being the air $23,5^{\circ}$ (at 6 a.m.). From Garoowe to Shimbiraale up to Sinujiif we have seen a lot of wells in evaporites; Shimbiraale well, 4 m deep, has a strongly sulphureous water.

A few kilometers ESE of Sinujiif, the Togga Nugal Valley becomes less and less marked and the river-bed is no more recognizable. In Kaalis region the Taleh Evaporites outcrop widely, whereas the Togga Nugal shifts northwards, so that it shows again its own river-bed 10 km downstream of Kaalis.

In this area we note the transition from the Taleh Evaporites to the Karkar Formation and the Togga bed appears well defined down in the valley, which trends to narrow, with relatively steeper slopes. The morphology appears different from the one represented by our topographic maps. Remarkable facts happened too. The great dry season of 1970, in fact, cancelled every sign of life, concentrating at Sinujiif the remained people. However, it is always remarkable the number of camels and wild animals, that find pasture and represent the reason for local life.

We think that the water problem of the Nugal Valley is really to be seen as function of pasture improvement, which would determine an increase of the number of head of cattle,

and, hence, of stable population.

Sinujiif built-up area can improve its water disponibilities either by drilling deeper wells or by creating a sub-surface dam (that is a diaphragm-wall) which should be used for collecting, east of the built-up area, a section of ground-water flow, while obstructing the loss and the pollution from Taleh Evaporites. A sub-surface dam would be very useful also just downstream of Kaalis, near Garas, where the Togga Nugal goes in the Karkar Formation, to give a new impulse to this territory.

The chemical analysis of a sample of water of a sub-surface well in the Togga of Sinujiif (April 16, 1979) gave the following results:

Ph: 6,8

Conductivity (28° C): S	:	I410
Organic substances (KMnO ₄)	:	mg/l : 9,48
Ammonia (NH ₃)	:	" : 0,500
Nitrites (NO ₂)	:	" : 0,075
Total hardness (CaCO ₃)	:	" : 958,98
Temp. hardness (CaCO ₃)	:	" : 140
Perman. hardness (CaCO ₃)	:	" : 818,98
Alkalinity P	:	" : 0
Alkalinity M	:	" : 140
Calcium	:	" : 889,0
Magnesium	:	" : 69,98
Sodium and Potassium	:	" : 29,76
Iron	:	" : 0,057
Copper	:	" : 0,001
Bicarbonates	:	" : 140
Carbonates	:	" : 0
Hydrates	:	" : 0
Sulphates (SO ₄)	:	" : 700
Chlorides (Cl)	:	" : 84
Nitrates (NO ₃)	:	" : 2,0

phospates (PO ₄)	:	mg/l : ---
silica (SiO ₂)	:	" : 16,80

We have also collected samples to see if there exist argillaceous deposits to build the diaphragm-wall. The subsoil of Sinujiif is formed by argillaceous sand, mud, practically impermeable, which could undoubtedly fit for that purpose. Moreover, the executed geoelectric section points out very well the continuity northward of the conductive zone, where samples have been collected - so as in the south - where values are even lower. Also in Sinujiif territory the stream migrated in the plane, depending on the meteoric regime; we may see it in the geoelectrical section, where the resistive zone, in correspondence with the alluviums saturated with river water, continues southward in the subsoil; far more northeastward, the alluviums of the Togga Garoowe could lie on the Togga Nugal ones. This increases remarkably the disponibilities of groundwater reservoirs of the Nugal Valley, permitting a variety of solutions, everyone very interesting, based on sub-surface dams construction.

We must note that under the very resistive alluviums, there is a zone still with fair resistivity (160 ohm.m) which might result productive in the lower part (it is always the same resistivity of reservoir rocks of Garoowe). There could exist, hence, a second aquifer.

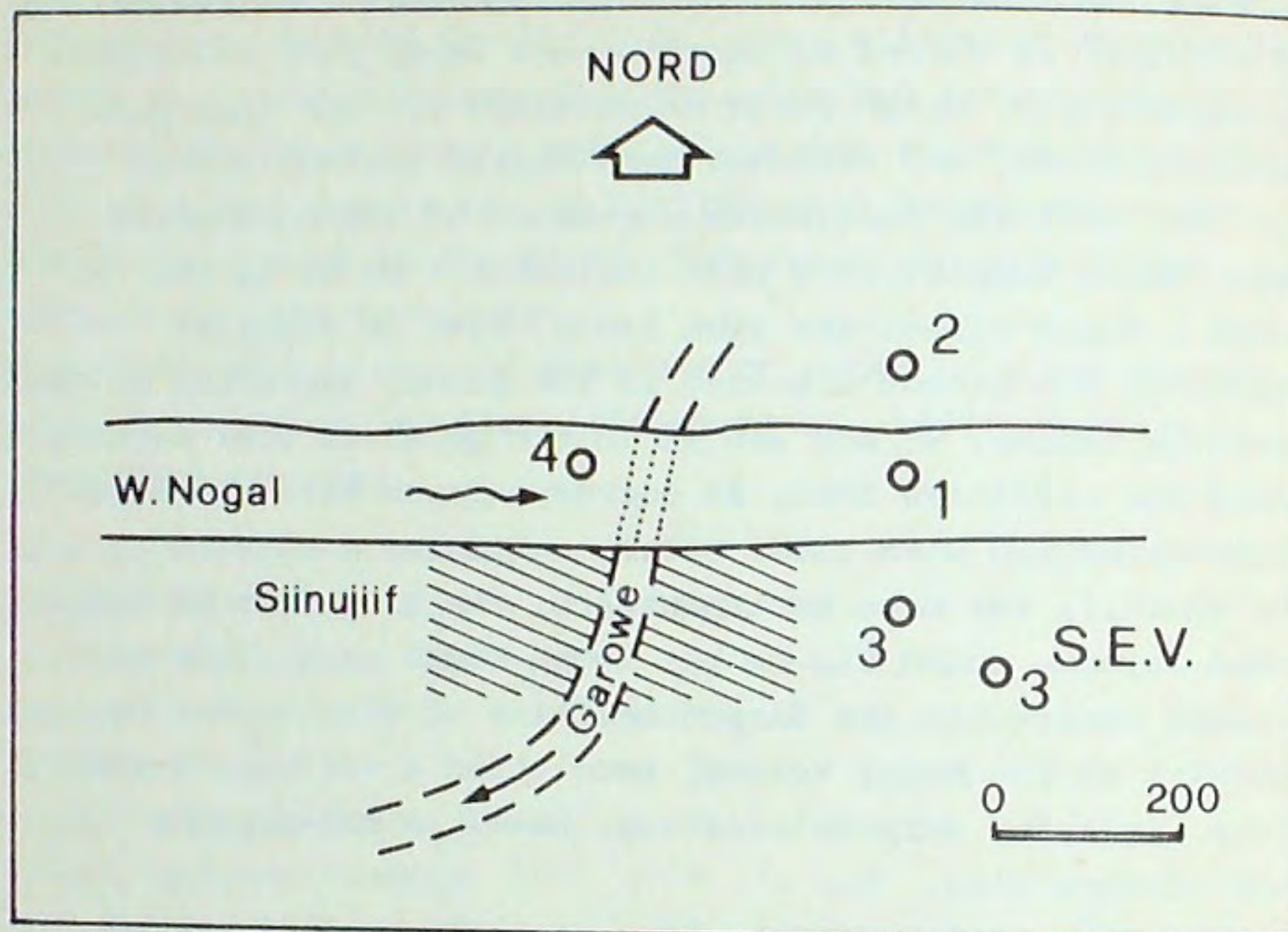
Geoelectrical prospection

see Figure 2 and 3

From the interpretation of four S.E.V. diagrams, achieved in this area, the electrostratigraphic landscape would be the following:

- covering. It is very heterogeneous in the upper part,

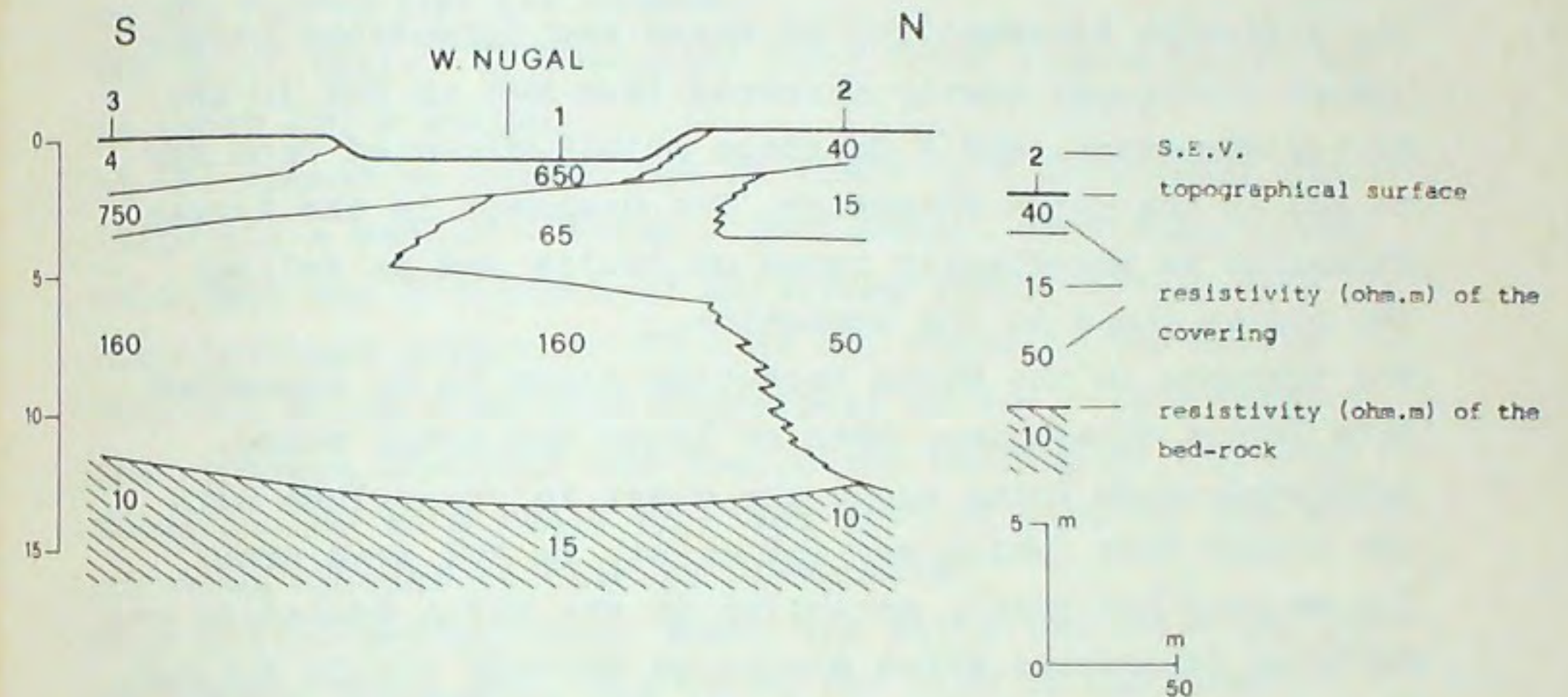
Figure 2. Location of geophysical (electrical methods) surveys in Sinujiif area



from about four S.E.V. 3 ohm.m to about 700 S.E.V. I and 4 ohm.m; pure clay constitutes the conductive electrostratum, stones and dry sand consist the resistive one. In the lower part there are soils resistive (about 50 and 150 ohm.m) and a thickness of about 15 m. The more resistive terms should accord with sands and stones, the less resistive ones with muds.

- substratum. It is represented with a electrostratum, whose resistivity can be evaluated between 10 and 15 ohm.m and which could identify itself with the Taleh Formation. It is interesting to observe that this formation main-

Figure 3. Electrostratigraphical cross-section of Sinujiif sub-soil



tains electric characteristics, practically exactly alike Garowe and Sinujiif, far from each other 60 km; the geoelectric section of Sinujiif points out that the resistive zone, possible site for an aquifer, has a notable thickness (8 - 10 m) not only in correspondence with the actual water-course (S.E. I), but also on the right side of the same (S.E. 3); on the left side the ground at 50 ohm.m could be an obstruction, at least partial, to the aquifer contained in more resistive soils.

The Nugal Valley in Eyl area

The low valley of the Nugal, that is 100 km long seawards, is characterized, from the hydrogeological point of view, by the limestones of Karkar Formation which is overlain by the sands, sandstones and conglomerates of the Hafun Formation.

The different permeability of these two formations establishes a drainage mostly directed from NNE to SSW in the Karkar Formation, and a drainage mainly directed from NNW to SSE in the Hafun Formation. The drainage in the Karkar Formation is prevalently based on faults and it follows the softer zones in the formation.

The drainage in the Hafun Formation seems to be connected with facies heterogeneities, both at large and small scale. Relatively high rains along the coast in comparison with the inland ones (which may not exist; in Eyl area about 175 mm rain per year), establish in the Hafun Formation remarkable reservoirs which discharge through little springs. In the topographic maps to the scale 1:100,000 these springs are called as follows:

- Dhinkaad
- Dhagaxlaha
- Bio Kulul
- God cad.

Certainly an important role on the intake area of these springs is played by the regional tectonics and first of all the subvertical big faults (direction NE - SW) that slope like graben, the more ancient formations of Karkar - Taleh, so that they were sealed by the Miocene-Oligocene transgression of the Hafun Formation.

The Togga Nugal outcrops about 10 - 12 km NO of Eyl. Waters outcrop depending on the outcrop of rocky substratum.

The complete exploration of these areas was not possible

for time reasons; we can pass through the valley only on foot, from Eyl we can climb up the valley by Land-Rover only for about 2 km.

The bed-rock is formed by lithologic types of the Karkar Formation which lie subhorizontal along all the bed of the Togga Nugal; the more calcareous or marlier zones outcrop on the talweg and its slopes.

The Nugal Valley in Dool-Dool area forms like a canyon and is about 250 m large.

At the moment we cannot say if there is a continuous flow (Sinujiif - Kaalis - Garas - Dool-Dool). From Sinujiif to Dool-Dool the thickness of alluviums seems locally very high (perhaps more than 70 - 80 m), while in the Kaalis area the Taleh Formation crops out; we are of the opinion that between Sinujiif and Kaalis the outcrop of the Togga Nugal is due to a fault NE - SW. East of Sinujiif the sandy alluvium shrinks so that it disappears.

From Kaalis to Dool-Dool there are still the alluviums with remarkable thickness, but we do not know if they contain water. These - as we mentioned above - outcrop to the east of Dool-Dool, but this could be due not to a continuous flow, but only to a local concentration.

In the dry season the observable amount is very low; in comparison with the amplitude of the drainage basin we can see that water reservoirs in the sub-soil are quite fair in Sinujiif area, and less numerous in Dool-Dool area.

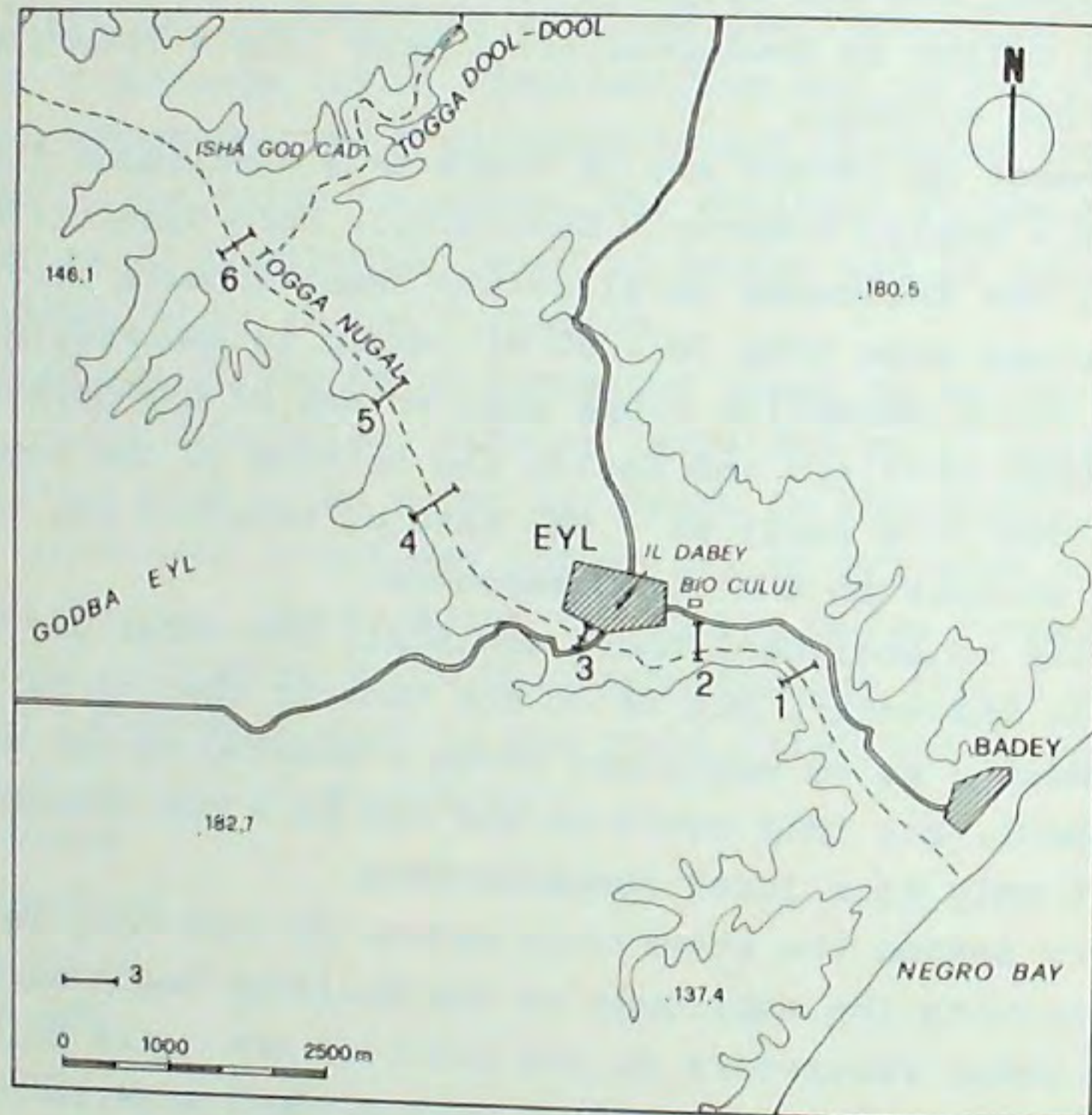
Our reflections get us to think that the outcrop is due to the contact between the Karkar Formation; the latter, in a regional sense, acts as a rock reservoir.

The retained-rocks, locally, are formed only by the Karkar Formation which we see to occupy the low Nugal Valley, about 5 km west of Eyl.

Now we are going to consider the Togga Nugal. We made surveys in 1979 and 1980. The difficulties were great of

course, so that data are indicative. They are, however, the first published. The surveys were made along six sections as illustrated in Figure 4.

Figure 4. Surveys in the Eyl area.



Section	Day	Hydraulic Discharge
No. 1	May 7, 1980	73.5 I/sec.
No. 1	May 8, 1980	490.0 I/sec.
No. 2	May 7, 1980	180.0 I/sec.
No. 3	November I, 1979	18/20 I/sec.
No. 4	November I, 1979	2/4 I/sec.
No. 5	May 8, 1980	1450.0 I/sec.
No. 6	May 8, 1980	700.0 I/sec.

At the same time, we made a survey of the discharge of the Bio-Kulul spring, on May 7 and 8, 1980.

We have to note that all the night of 7th long, there was abundant rainfall and that, the day before, it had rained in the Nugal (mostly in Kaalis area on May 4, 1980).

The hydraulic discharge of the Bio-Kulul passed from 1.5 lit/sec on May 7, 1980 to 3.2 in the night of May 8, 1980.

The collected data let us make some considerations:

- The groundwater flow of Eyl is completely independent from the superficial one and is connected with the quaternary formation, widely cropping in the Eyl area.
- The Il-Dabay spring is connected with drainage of the outcrops from the plateau north of Eyl, and its hydraulic discharge varies from about 9 lit/sec to about 20 - 25 lit/sec.
- In correspondence with Eyl, under the quaternary formation very pervious rocks must exist, which establish a wide loss of the Togga Nugal; it is enough to consider that in about 3 km, the Nugal disperses as far as 2/3 of its discharge.
- The fact that the Togga Nugal discharges are strongly influenced by rains, suggests a very low infiltration.

Eyl springs are quite well-known. There are cold and hot springs (in particular see Popov and Kidnay, 1972).

A typical example is the hot spring of Bio-Kulul, where we surveyed a water temperature of 38° C (being the temperature of air 31° C). The spring is about 1 km SE of Eyl and the water outcrops, gurgling in pressure, about 10 - 15 m above the Togga Nugal Bed.

The water temperature is in favour of a deep origin of the spring, but the discharge variation following the rain season gets us to think that the same spring has also a more superficial intake area; in fact, an increase of hydraulic

discharge is followed by a temperature decrease of about 2° C.

In the same area, we also observed the emergence of two other little hot springs, evidently due to presence of an impermeable bed, just above the Togga Nugal bed.

The groundwater flow of springs is completely independent from the Togga Nugal one.

The origin of these hot springs is possibly connected with deep faults and is due to the geothermal gradient.

The contact-zones between fresh and salt water toward the coast is variable according to the tides, but is meaningful the fact that at Badey there is a dug-well from which people take fresh water. There is, hence, a thin aquifer floating on salt water; we think that the penetration of salt water in the inland is of about 2 km.

From the practical point of view, it is evident that it would be really useful to prevent the loss of Nugal water (NO of Eyl), without compromising or prejudicing the big springs of Eyl.

A plan of utilizing the Togga Nugal plains is being considered by our group.

ACKNOWLEDGEMENT

Our thanks especially go to General Xuseen Kulmiye Afrah, Vice President of the Somali Democratic Republic, for his great encouragement and suggestions. Sincere appreciation is also expressed to all our friends of the Faculty of Geology at the Somali State University. We also wish to thank Mrs. Rory Todaro of SIDAM, Mogadishu, and to Mrs. Fiorella Zattoni for the patience shown in translating this report.

Mao Abdurahman H. Awes / Karl-Heinz W. Bechtold

REGIONAL DISPARITIES AND REGIONAL DEVELOPMENT PLANNING IN DEVELOPING COUNTRIES: THE CASE OF SOMALIA

Theoretical Considerations on the Problems of Regional Development in Developing Countries

Introduction

The reason we use the cautious headings 'theoretical reflections' and 'an attempt at an empirical assessment' in this paper is that there is an almost complete lack of regionally differentiated statistics concerning Somalia. As a consequence, all statements about individual subregions must be made with great reservation. Although large differences between various parts of the country are known from personal observations, it is impossible to quantify these observed disparities for the purpose of making direct comparisons between one region and another. In the following we shall therefore confine ourselves to describing the regional disparities, their possible causes, and the political and economic strategies for achieving a better balance between rich and poor regions (part I). Wherever possible, we shall consider examples from Somalia (part II). Our paper is thus an attempt to draw attention to the regional problems of Somalia and to give impetus to further scientific study.

The Problem

Although the problem of regional disparities may also be observed in the industrial nations and in the centrally planned economies, it is of particular significance in

developing countries. Here the disparities are frequently very acute, and since the boundaries drawn during the colonial period were arbitrary, national cohesion is weak while centrifugal forces are strong. As a result, there is pressure to pursue an intensified regional policy in order to create the conditions necessary for economic development. In other words, to achieve a regional economic balance in these countries, it is necessary for the state to intervene in support of the less developed regions. This brings up the problem of how to promote a balance between the regions without sacrificing overall economic growth - and here there is a considerable division of opinion as to possible solutions.

The simplest method to eliminate regional disparities would be to leave the underdevelopment regions entirely on their own and to depend upon the 'self-healing forces' of the market economy. This strategy, which can be called 'passive development', consists essentially in letting the unemployed and underemployed work forces migrate from the underdevelopment regions, which automatically results in an increase of the average labor productivity and average per capita income in the region. Experience in industrial countries has shown, however, that such a strategy increases regional disparity because the regional economic structure is adversely affected by the departure especially of trained and more mobile workers, and because the population structure shows an overproportionally high share of the aged and women. The attractiveness of the backward regions further declines so that it cannot be said that the regional disparity has been diminished.

Also, no satisfactory results can be expected for the developing countries from the pursue of such a strategy. Here extensive migration to the larger cities, coupled with an already high rate of population growth, has led to a popu-

lation agglomeration for which these cities were in no way prepared and which exceeded every acceptable degree. If such an extensive migration is to be prevented in the future, then the living standards in the backward regions, which usually have agrarian structures, will have to be improved. It has been shown in the industrial countries that regional economic development by means of tax, monetary and credit policies has only limited impact. In the developing countries, there is usually a lack of investors with sufficient capital, and those who are able - as the foreign investors - prefer to invest in the already developed regions.

A necessary - but not sufficient - condition is, therefore, to improve the attractiveness of the permanent sites in the underdeveloped regions in order to make production possible on the same or even better terms as compared to the already more developed regions and thereby to create incentives for investment.

In any case, this means the expansion of the infrastructure in the underdevelopment regions which is always completely insufficient.

The Causes of Regional Disparities

It has been shown that the developing countries, particularly the larger ones, are characterized by considerable regional differences in the level of development. As a rule, the industrialized population centres on the coast, develop more quickly than does the predominantly agrarian hinterland.

Of all the explanations for regional development disparities, the natural differences between areas appear to be the most convincing. Their significance does not only lie in the natural endowment of the region with (natural) factors of production, but as well in the costs caused by long distances,

and by this is meant not only the transportation costs, but as well, the loss of communication and so forth, for example, transfer of information. Important for agriculture are a suitable topography, the quality of the soil and the accessibility to water. Of importance for industry are above all the deposits of natural mineral resources and the availability of primary sources of energy (waterpower) or fuel, while the topography of a region is decisive for the transport costs of all sectors, particularly when the individual sectors are dependent upon purchasing raw materials or pre-products from other regions or, respectively, upon exporting their products to other regions or abroad. Of importance here is the access to waterways (sea or inland water navigation) because these offer the most economical transport possibilities.

Nature, in addition, determines to a certain degree the population and settlement structure because in order to be habitable for man demands are placed on the environment which are independent of the conditions of production such as security from floods, availability of drinking water, and accessibility to transport facilities.

Because the level of technology is continually changing, the importance of the prerequisites of nature for individual economic areas as well as for human habitation also changes. Differences in health care, birth patterns and migration decisively determine the size and the structure of the population and, therefore, the level of development of the individual regions. At the regional level, especially in developing countries, extreme shifts in demographic structures can take place because more extensive population movements can occur within a nation than between nations. Because of various reasons (material need in the emigration areas, the pull effects of the immigration centers, absorption of refugees) migration takes place. Especially men of employ-

able age migrate to the city centers and they are often followed by members of their families. Therefore in the emigration areas from which migration takes place, the share of aged and of women is larger than in the immigration areas, which explains why the activity rate is lower in these areas.

Often regional development differences can be explained by historical contingencies which have little or at least no direct economic reasons. Such a contingency which is especially characteristic for developing countries is the total complex of colonialization by the European colonial powers. One trace of this is the state borders which today mostly still exist and which often separate areas which originally constituted a unit and, without these borders, could develop considerably better economically.

Because international borders signify drastic limits for trade as well as for population migration, the migration and trading area of the peripheral area thusly created end at the border, while at the same time the border itself is not essentially economically attractive. In addition, the population in the border areas is often ethnically and linguistically different from the majority of the population and this, in addition to the spatial distance from the administrative centers, makes it difficult to push through the interests of the border areas. In general, this leads to a more limited economic attractiveness of the border areas.

Coastal regions are an exception to this because, although they represent border areas, they have the advantage of participating in national and international maritime traffic. The easy accessibility of the coastal regions was also the reason why the conquest of most of the colonies began from the coast and why the colonial powers, whenever possible, maintained their centers of administration at the coast. This

may well be the reason why the coastal regions in most of the former colonies are still today the most developed regions, while this only partially holds true for the industrial countries.

From the coast, the colonial powers opened up the hinterland, usually along the railroad lines which they advanced into the interior of the country. Because of this, these countries have no integrated railway networks, but rather more or less interrelated terminal lines into the interior. The railroad lines were usually not connected internationally because of the rivalries between the colonial powers. Instead, we find railway networks which, in part, are relatively worthless for the countries today, which were laid for the defense of the colonial empire and did not correspond with the direct economic interests of the regions.

Also, the administrative division of the developing countries is often a left-over of the colonial period when they served to facilitate the administration of the area through a tightly and centrally organized administration. Mostly this was carried over after independence without basic changes.

One can present many other examples of decisions which decisively influence the regional structure which are based neither on the given conditions of nature nor on other factors of location and which here are treated under the heading of political reasons. Included are all the decisions of the former colonial rulers and those of the political leadership after the attainment of independence, which serve only the personal gain, personal increase in power or result from personal obligations with respect to specific groups or with respect to specific regions. Precisely with regard to decisions with regional policy implications - and this includes practically all governmental decisions - one often suspects that they are made in favor of individual

groups of people who are often identical with the family of origin, the class of origin or the population of the region of origin of the political leader.

The effects generally characterized as advantages of agglomeration for industries result in external utilization and improvement in their competitiveness and their profitability. As long as they are not offset by specific agglomeration problems (pollution of the environment) which are greater than the advantages of agglomeration, regional concentration improves simultaneously the total economic welfare. The combined effect of the advantages and disadvantages of agglomeration - here called the net agglomeration effect - can be positive or negative. The consequence for regional policy making is that for industries only a limited number of permanent sites come into consideration while extensive areas have to remain practically without industry. It is therefore understandable and reasonable that the permanent sites are concentrated even when the limits of the capacity of these areas because of the limits of the external effects are quickly reached. For extensive areas this means, however, that they had to remain practically without any industry while the local crafts continued to lose importance in face of the competition of the cheaper industrial products.

It is an important question if regional development is alone determined by the conditions of nature, by historical contingencies and economic laws, or if other factors, which together with the historical-political reasons often are characterized as non-economic factors, are as important. Here one would have to think above all of the basic attitude of the population toward economic activities in the broadest sense and toward the more or less institutionalized parameters which influence their lives.

The possibility has to be mentioned, however, that the basic attitudes of the population in the individual regions vary

considerably from one another and that the different population groups are not interested in material success to the same degree. In older literature, for example, one finds repeatedly the reference to the necessity of entrepreneurial personalities, in the sense meant by Schumpeter, who are prepared to accept responsibility and to take risks. Doubt has been raised if there is an achievement motivation at all in the developing countries which is comparable to that in the industrial countries. Other considerations which are more important with respect to the theme of this study focus on the group specific differences and, more precisely, those of an ethnographic type.

The developments in Japan and China have shown, however, that economic development problems cannot be simply traced back to specific ethnographic peculiarities. A better explanatory attempt appears to be that most of the developing countries, especially the largest and most populous among them, are ethnographically very heterogenous in contrast to the European nation states (which by and large are ethnically and linguistically homogenous).

Also, the institutional parameters differ in the regional state, which refers less to the generally uniform constitutional parameters and the validity of the individual laws and other legal regulations than to the customs and usage which are handed down, the religious rites or tribal law which regulate individual and collective actions. In addition, there are those parameters which are determined by property, possession and utilization patterns, by fragmentation of farm holdings and the places of work and which can be spoken of as economic order in the broadest sense.

The explanatory approaches for the emergency of regional development differences which are cursorily presented here, in addition to their incompleteness, suffer above all from the fact that the individual factors are interdependent and

neither clearly of equal importance nor clearly hierarchial. It is, therefore, not possible to examine all factors in detail and to establish the responsibility of each individual factor for the establishment of the regional development differences.

The Goals of a Governmental Policy designed to Establish Regional Balance

The basic question in development policy and development planning is the definition of goals that should be followed. Various groups of goals can be discerned which can be differentiated in that they, as seen from the perspective of economic policy, are operational to various degrees, whereas the less operational basic goals of societal policy such as peace, freedom, justice, security and prosperity reflect a specific religious or political attitude. From the moral perspective, the elimination of the regional imbalances is the concern of regional policy, especially with respect to raising the living standards of the poorest segments of the population in these regions.

The elimination of regional inequalities is not only, however, a question of ethics or morals, but as well one of economic efficiency. First, this is because individual areas have limited capacities. That is, with increasing population density, respectively with increasing concentration of production in individual permanent sites, the agglomeration advantages are being contrasted by the disadvantages of agglomeration, which could actually outstrip them so that there is a negative net agglomeration effect.

The often ethnically and linguistically heterogenous structure of the developing countries leads to special requirements. As compared to European-type nation states, the feeling of unity is only limited. In many cases, the unifying factors can be traced back to the former colonial

power rather than to a common precolonial history. The borders, the official language, the educational system, the administrative structure and the economic and transportation structures are often the legacy of the colonial period. The maintenance of the unity of the state in the developing countries, therefore, leads to special demands necessarily and above all for development policy and development planning.

In many states the question of regional development contains strong political implications to such a degree that the extreme sensitivity on this subject makes any public discussion impossible. Therefore, the treatment of this question often stands in reversed relationship to the need for integrative policies.

Partially, the individual regions jealously guard 'their' share of the state expenditures, the foreign exchange or the development programs. In this case, from the perspective of integration policy, it is no longer of utmost importance to develop the backward regions, but rather to consider the regions in terms of specific allotments of quotas, for example based on the size of population, which, although they are no longer designed to diminish regional inequality, guarantee (for the moment) the unity of the state.

Regional Policy Instruments of Government Development Policy

In order to realize the regional policy goals, it is necessary to select and shape the corresponding economic policy instruments. As long as the individual instruments are not explicitly regionally differentiated, it can be assumed that they have 'area-neutral effects', that is, that they have the same impact in all regions. Correspondingly, one could assume that instruments which are explicitly differentiated by area show different regional effects. This distinction

is, nevertheless, strictly hypothetical, because in the final analysis, all instruments of economic policy, if not all governmental activity, have varied spatial effects.

In contrast to the 'area neutral' instruments, which do not explicitly differ between regions, but nevertheless have different regional impacts, are all those measures which are from the very beginning directed to regulating the economies of individual regions.

First, there are legal policy measures because they are directly effective and do not necessitate payment by the government. To be considered here would be, for example, a settlement or investment stop especially in very developed, or overburdened regions, the requirement that large enterprises establish branches in the underdevelopment regions, the introduction of domestic restrictions for trade between regions, and the creation of compulsory cartels or syndicates for the buying and selling of individual products, and so forth.

Government offers of subsidies or tax exemptions for investments in underdeveloped areas and/or offers of further financial incentives for industry which have the character of subsidization of current production also promise success. Here one is dealing with an almost classic instrument of regional economic promotion.

Often the government in developing countries takes over the entrepreneurial function itself, either by participating in private companies, by founding semi-autonomous corporations or by investing directly. In most of the countries of the world, therefore, the government is the most important client. It is therefore repeatedly demanded that enterprises from the underdevelopment areas should be given preference with public orders because in this way the economy of this region could be both easily and effectively promoted.

In general, the variety and not always obvious interaction

of the various economic policy instruments makes it difficult to shape a development strategy which also meets the goals of regional policy. This holds true especially for developing countries where scarcity of financial means and institutional and personnel limits do not allow much room for an engaged regional policy.

By infrastructure measures is meant the necessary basic structures which are indispensable for economic development of an area. This includes the total of all facilities of the so-called public service administration which are provided by the state or other public territorial authorities (energy supply, transportation and traffic systems, school system and housing).

The expansion of the infrastructure is a necessary, but in no way sufficient, condition not only for economic development in general, but as well, provides decisive points of departure for regional economic development, that is, for the more uniform distribution of economic forces in the area. If additional economic incentives cannot be offered, the infrastructure can lead to a drainage effect. It is understandable that a new transportation link in a not very accessible and backward region only favors the migration of the labor force or respectively of the population there if the area continues to remain unattractive because of, for example, lacking supply of electricity or supplemental industries, in spite of the building of a road, railway line or airport. A similar effect takes place when the educational system is promoted one-sided. The raised expectations with respect to professional chances and income cannot be met in the home region, so that the qualified work force migrates or is not available for the development of the region.

Attempt at an Empirical Assessment of the Regional Disparities in Somalia

Genesis of Regional Disparities in Somalia

In precolonial times (before 1890) Somalia had a tribal community form, the clan-federation system. The various clan federations were connected by complex treaty systems. Each clan federation had its own territory in which its laws were in force. The interactions between the clan federations were based on a subsistence economy. The differences in prosperity within these individual clan territories were not as great as the differences existing today.

At the beginning of the colonial period the country was divided up arbitrarily into four parts. The colonial invaders (England, Italy, France, Ethiopia) who in some cases secured their rights through treaty, broke up each of these parts into regions and districts without regard to the ethnic affiliations of the inhabitants or to the traditions of the clan federations. Each of the colonial territories established an urban centre in which administrative power was concentrated (Hargeysa in the British territory in the north, Mogadishu in the Italian territory in the south, and Djibouti in the French territory far to the north). Besides the integration problems which arose as a result of the development of different constitutional systems, official languages and institutions (police, armed forces), there emerged pronounced socio-economic disparities between the northern and southern territories. Whereas in Italian Somaliland economic interests were strong and a plantation economy (bananas, cotton, sugar-cane) was developed by the Italian company SAIS and by trade organizations, in English Somaliland strategic interests apparently had precedence. There was correspondingly little interest in economic invest-

ments, and public spending for administration, infrastructure, education and health was minimal. No communication system was built between the two territories, and economic activities in the territories were concentrated in a few disconnected regions. This contrasted with a large, non-monetary economic region occupied by the nomadic and semi-nomadic population living at a subsistence level. During this historical phase commercial activities became concentrated in the vicinity of the capital Mogadishu, the banana-export port of Kismayu and the triangle Hargeysa - Berbera - Burao in the north.

After independence in 1960 the first Somali government took over the outmoded colonial economic structure without making any major changes. Thus an economic model was continued which consisted of a few economically viable integrated areas, whereas in the rest of the country subsistence production remained dominant.

The market mechanism in Somalia after independence proved to be inefficient in allocating the naturally available resources. Although the government made efforts to remedy this situation by means of an active regional policy, it had only limited success.

In the 1960s there was a phase of strong economic growth, but the various parts of the country continued to develop divergently. Economic stagnation in some regions caused the most vigorous and healthy inhabitants to emigrate to the slums and ghettos of the cities.

After the socialist revolution in 1969 the new government quickly realized that the previous colonial division of the country into large regions and districts was a hindrance to national development. In 1971 the local government reform law was passed, which introduced a new model of local administration. The previous regions and districts were abolished, and in their place 14 smaller regions and 78 new

districts were created. The purpose was to increase the participation of the population in political decision-making and to make the administrative system more transparent.

The regional re-organization in Somalia also took account of areas which belonged together for ethnic and geographical reasons, thus creating the basis for an active regional policy.

The phase of administrative and industrial concentration in Mogadishu lasted from 1960 to 1969. Industrial efficiency was the sole criterion for allocation of resources.

The years 1969 to 1974 were characterized by a revolutionary upturn in politics and in economy. The aim of regional policy during this period was to settle new industries in different regions of the country. However, this was largely unsuccessful.

The period from 1974 to 1983 is one in which the goals of economic and regulatory policy in Somalia were in constant change.

The Causes and the Socio-Economic Consequences of Regional Disparities in Somalia

Now it is necessary to identify the forces which increase the tendency towards regional inequality in low-income countries such as Somalia. The process is a cumulative one in which there is an aggravation of the regional inequalities that result from exogenous factors (such as the supply of resources).

The amount of capital invested by the state is a central determinant of overall economic development, and public expenditures are the main instruments for promoting development in selected regions. The private sectors and private investment can be controlled indirectly through measures in financial and credit policy (tax incentives, etc.).

Since independence the Somali government has tried to maintain continual economic growth. Its goals have been broader control over growth, national economic integration, and reduction of regional disparities. At the time when these goals were set, however, there was an inadequate awareness of the need for regional income redistribution, along with a lack of political will. This can be seen from the published plans and official documents of the period. The main weakness of former economic plans has been their lack of specificity, i.e. their excessive generality.

The tendency to promote the growth of Mogadishu and a few other urban areas at the expense of the rural areas is inevitably leading to greater disparities between the regions and between the various social groups in the population. The consequences of regional disparities in Somalia are particularly glaring. Tribalism and the influence of the clan federations further intensify the regional and ethnic disparities and give them political dimensions.

Since independence industrialization and state activities in Somalia have been concentrated in Mogadishu. This short-sighted policy has had a great influence on all other activities of the state. Statements about decentralization of industry in public documents have turned out to be mere lip service. These declarations of intent have never been transformed into practice.

The forces of economic agglomeration which have led to increased regional disparities in Somalia are very strong and are steadily expanding. They tend to be self-perpetuating, and they magnify differences in prosperity which already exist.

In the phase of global economic recession the consequences of regional disparities are being intensified by rapid population growth. This is made particularly true by the

fact that the modern sector is still very small and is unable to absorb workers who lose their job in other sectors. Rising unemployment and criminality increase the regional disparities even more.

Regional Political Measures to reduce existing Disparities

To achieve even a relatively balanced regional structure it will be necessary to make fundamental corrections in economic and financial policy. The state and the economy must make greater efforts in the future to create productive employment and higher incomes for the population, especially in rural areas.

This could be accomplished in our opinion through the following measures:

- development of small industries and trades in rural villages oriented to local resources (agriculture, cattle husbandry, fisheries, mining, etc.);
- expansion of the construction industry and of tertiary activities in selected small district towns;
- development and promotion of tourism in areas with a suitable landscape (e.g. Kismayu) in order to earn foreign exchange.

A further factor that could help to correct regional disparities would be a change in relative prices. An increase in prices for the most important agricultural products can lead to an improvement of the income situation in marginal rural areas.

This however, means that food prices for the urban population will rise, something which no government in a developing country can accept without putting its political power in jeopardy. Subsidization of the food supply to the urban population and to the urban centres at the expense of the rural population is essential to government political

survival.

The type of demand also has a regional effect. An example is the redistribution of income from rich groups of society to poorer groups, whereby different income elasticities are to be expected. In this particular case there will be a rise especially in food demand in the poorer regions.

Prospects

Somalia's political goal must be to develop a strategy which gives priority to satisfying the basic needs of the population. The regional policy of the country must be seen as a part of this strategy. One objective must be to make public services (health, education, training) more available to the population. In addition, attention must be given to the vital needs of poor families with regard to private goods (food, clothing, shelter, etc.). A policy which aims to achieve a regional balance of prosperity must provide for a fairer distribution of income, taxes and state expenditures.

The Somali government's present planning and distribution of state investments is not sufficient by itself to implement such a policy. Private investments and foreign capital investments are necessary in order to accelerate the development process.

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Christer Krokfors

ENVIRONMENTAL CONSIDERATIONS AND PLANNING IN SOMALIA

Somalia can as a country be classified as dryland, i.e. there is at least one arid period during the year. The environmental conditions in drylands are very divergent and show often a high degree of 'randomness' even in their principal features. Planning of resource use in these areas is difficult and requires that careful attention is paid to spatial and temporal variations in the environment.

In the literature on Somali development and development planning, there are only limited discussions about regional and local differences in the environment. The country is treated as a unity, sometimes very broad topographical regions are referred to, the interriverine area is mentioned, and the rainfall regimes are described in a very generalized way (Economic transformation ... 1977:259-263; Jerve 1982: 57-60; Lewis 1961:33-42; Prothero 1968:3-7). Even the planning authorities seem to pay little attention to environmental differences. During a visit to Somalia 1976/1977, I had several discussions with planners about various development projects in rural Somalia. When asking how local environmental variations within the project areas were considered, and how the nomads involved should respond and use the local resources, I often got the answer "The nomads know themselves" (Krokfors 1978:206-207). This is of course true, but on the other hand, it is impossible to achieve sound project design and implementation if certain aspects are excluded. In this case the Somali planners do not differ from planners in most of the African countries. In project planning and evaluation, economic and technological

aspects dominate, the environment is looked upon as something neutral which exists in the background. Such a development approach is extremely dangerous. The maintenance of the resource base in arid areas is intricate, the environment very fragile and environmental considerations should therefore take a prominent position in every resource use project.

One of the most outstanding features of the Somali environment is its aridity. The purpose of this paper is to describe some aspects on aridity in Somalia and the Horn of Africa, and how the arid conditions should be considered in physical planning. Aridity is an expression of the water balance within a region. An 'arid region' is one where the potential evaporation is greater than the supply of water through precipitation. Several attempts have been made to determine the exact relationship between precipitation and evaporation and to delimit arid and humid regions. In most of these attempts only climatic parameters have been considered. If the evaporating land surface is included, it has been in a standardized form, and it is the climatic parameters that still allow for variations in humidity/aridity (see Jackson 1977:104-125; Lauer/Frankenberg 1978:45-46; Lauer/Frankenberg 1981:63-64).

The substitution of the evaporating land surface with climatic parameters has caused that the hitherto existing measurements of humidity/aridity have had rather limited value from a geocological point of view. Recently however, the German geographers Wilhelm Lauer and Peter Frankenberg have developed a new method for calculating evaporation and also including the geocological qualities of the evaporating surface (Lauer/Frankenberg 1981). The measure called potential regional evaporation (potentielle Landschaftsverdunstung) makes it possible to study spatial and temporal variations in humidity/aridity in a much more sensible way

than earlier. The potential regional evaporation is defined as the evapotranspiration from a real land surface with optimal water supply. The water supply is optimal when there is a generative development of plants under minimum supply of water. The real land surface includes the vegetation and its ecophysiological characteristics as far as optimal transpiration is concerned.

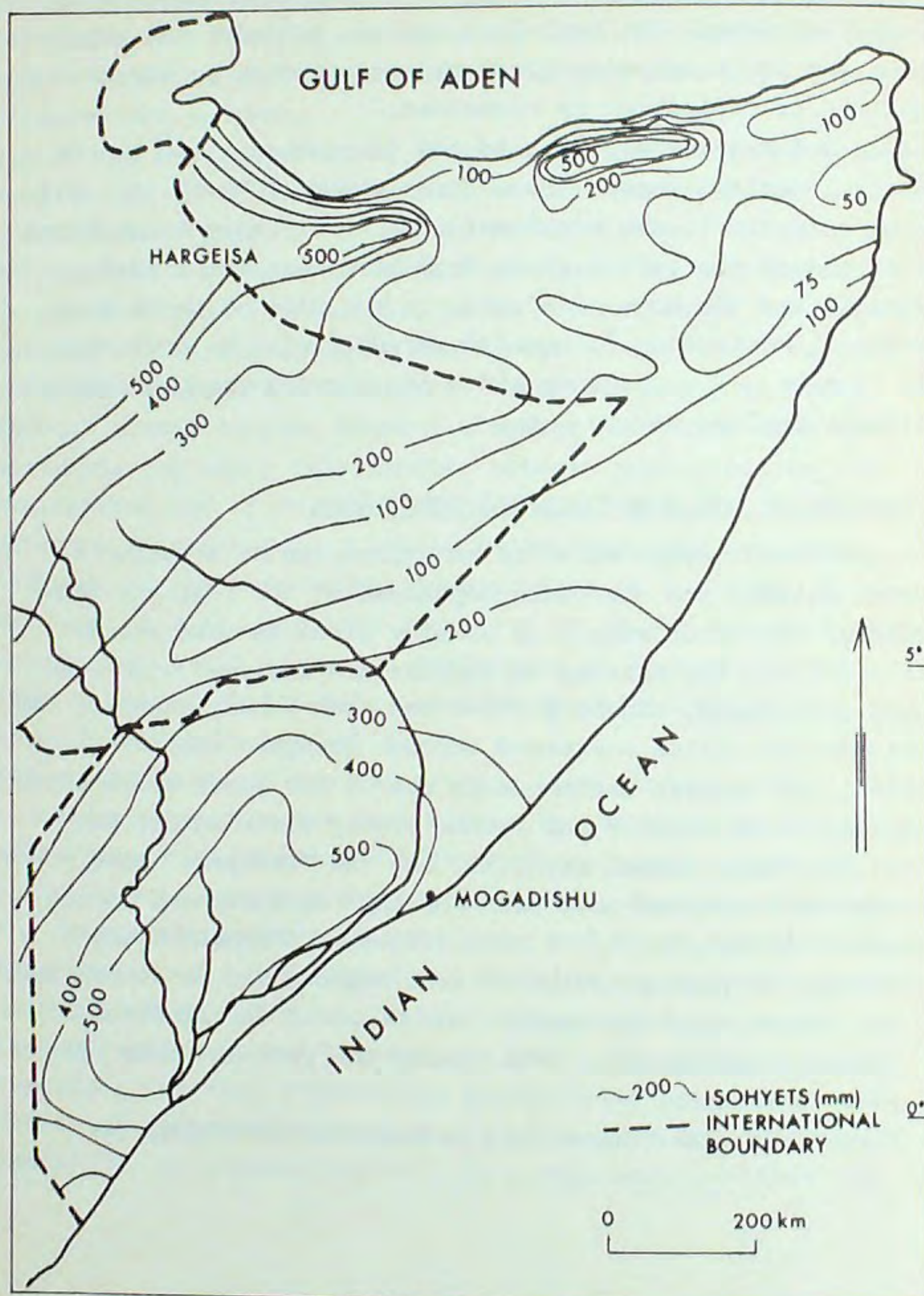
Lauer and Frankenberg applied the new method first to the central Mexican meseta (Lauer/Frankenberg 1978:40-53), and more recently to the continent of Africa (Lauer/Frankenberg 1981). From the latter study data have been compiled for Somalia and the Horn of Africa. On the base of these data, regional variations in humidity/aridity will be presented in form of a few diagrams and a map showing the hygrothermic climate regions of the Horn.

Evaporation and geocological conditions

As mentioned, evaporation is an expression of a region's water balance and therefore dependent of the region's water supply. The water supply is usually given as mean annual rainfall and the spatial variations are analysed with isohyet techniques. Figure I shows the mean annual rainfall for the Horn of Africa expressed through isohyets (Report ... 1979). The isohyet technique is useful for areas where precipitation is regular and rather evenly distributed. But both the "mean annual rainfall" and the "isohyets" have severe shortcomings when used for arid regions, and do not express the complexity of arid climates. The main characteristics of precipitation in arid regions can be summarized:

- the amount, and the spatial and temporal distribution of rainfall vary greatly both during the year and from one year to another;
- there is a close connection between the geocological

Figure I. Mean annual rainfall in the Horn of Africa.
Adapted from Report ... 1979.



structure of the terrestrial landscape and the precipitation because the rainfalls are mainly convective.

The mean monthly rainfall is therefore a more suitable, if not fully satisfactory measure, and is used by Lauer and Frankenberg when describing regional variations in aridity/humidity.

If the supply side of the water balance is relatively easy to quantify, the evaporation side is problematic, especially if the real evaporation surface with all its variations is to be included. Hitherto, the potential evaporation has been expressed as climatic evaporation from a free water surface, or as potential evapotranspiration. None of them relate to the real conditions of the evaporating terrestrial surface. The complex evaporational behaviour of terrestrial regions can hardly be defined in a single term. Lauer and Frankenberg (1981:II-24, 38-46) therefore used a twofold approach:

"The term for the theoretically important climatic evaporation was recalculated according to data based on a newly conceived evaporation formula. --- The geocological components were taken into account by a reduction parameter and were derived from evidence in the field supported by data."

For the purpose of this paper, climatic evaporation is only of limited interest and will be dealt with shortly. The recalculation of climatic evaporation from a free water surface has two components: the equivalent temperature and the saturation deficit. The data needed for these calculations are obtainable from every weather recording station: mean temperature, relative moisture and air pressure (Lauer/Frankenberg 1981:18).

The potential regional evaporation is derived from the climatic evaporation by a sliding reduction factor. The factor contains the soil : plant ratio, the transpirational be-

haviour of the vegetation, the albedo, the oasis effect, the severity, and edaphic factors. The different components are arranged according to the main vegetation types in Africa. The rain forest has minimum (0.8), the desert maximum (0.2) reduction from climatic evaporation (Lauer/Frankenberg 1981:37-42). The main difference between potential regional evaporation and potential evapotranspiration is, that the former is based on the real vegetation in the region, the latter on a standardized vegetation. The variations in potential regional evaporation depends on variations in the evaporating land surface while variations in the potential evapotranspiration are due solely to climatic factors.

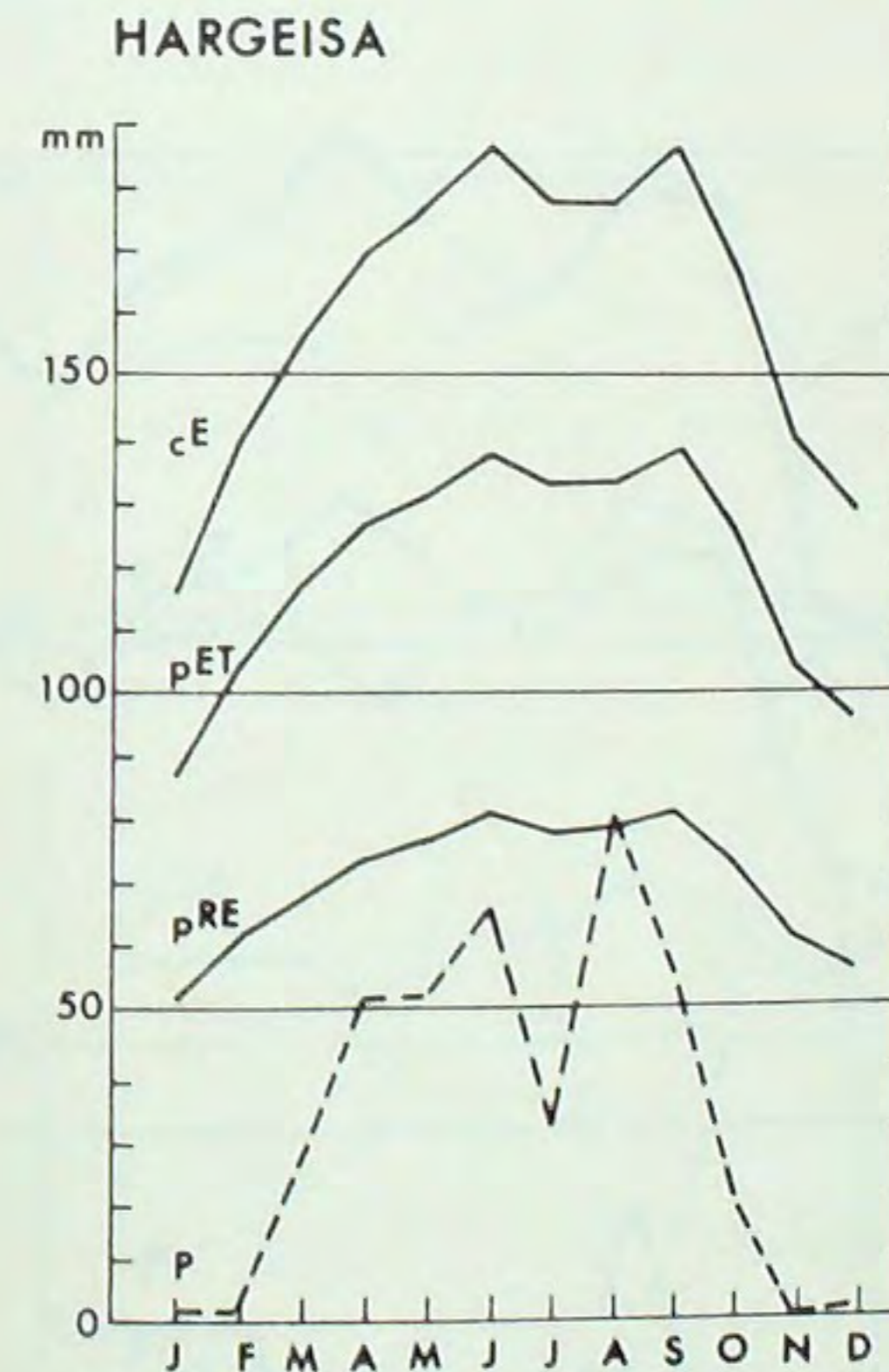
The potential regional evaporation is used to identify regions and periods which geocologically are either humid or arid. If the potential regional evaporation exceeds the mean monthly rainfall, the month is arid. The degree of aridity can also be determined.

The number of arid and humid months can be analysed spatially with isohyromenes (number of arid or humid months) (Lauer/Frankenberg 1981:59-60). If one as a starting point takes the basic geocological parameters heatenergy and water, a climatic classification based on temperature and humidity regimes can be constructed. Lauer and Frankenberg combined the isohyromenes with isotherms for certain mean annual temperatures. The chosen isotherms are of biogeographical importance: 27°C as the margin of hot tropics, 24°C as margin of warm tropics, and 18°C as margin of tropics. An analysis of the combined pattern of isohyromenes and isotherms made it possible to identify certain hygrothermic climate types and regions. These types and regions are characterized by a certain mean annual temperature level and a specific number of humid months.

Evaporation and hygrothermic climates in the Horn of Africa

From data published by Lauer and Frankenberg (1981:II2-II3), diagrams over monthly precipitation, climatic evaporation, potential evapotranspiration, and potential regional evaporation were constructed for Hargeysa, Las Anod, Erigavo, Burao and Berbera (figures 2 - 6).

Figure 2. Monthly variations in precipitation and evaporation in Hargeysa. (P = precipitation, cE = climatic evaporation, pET = potential evapotranspiration, pRE = potential regional evaporation).

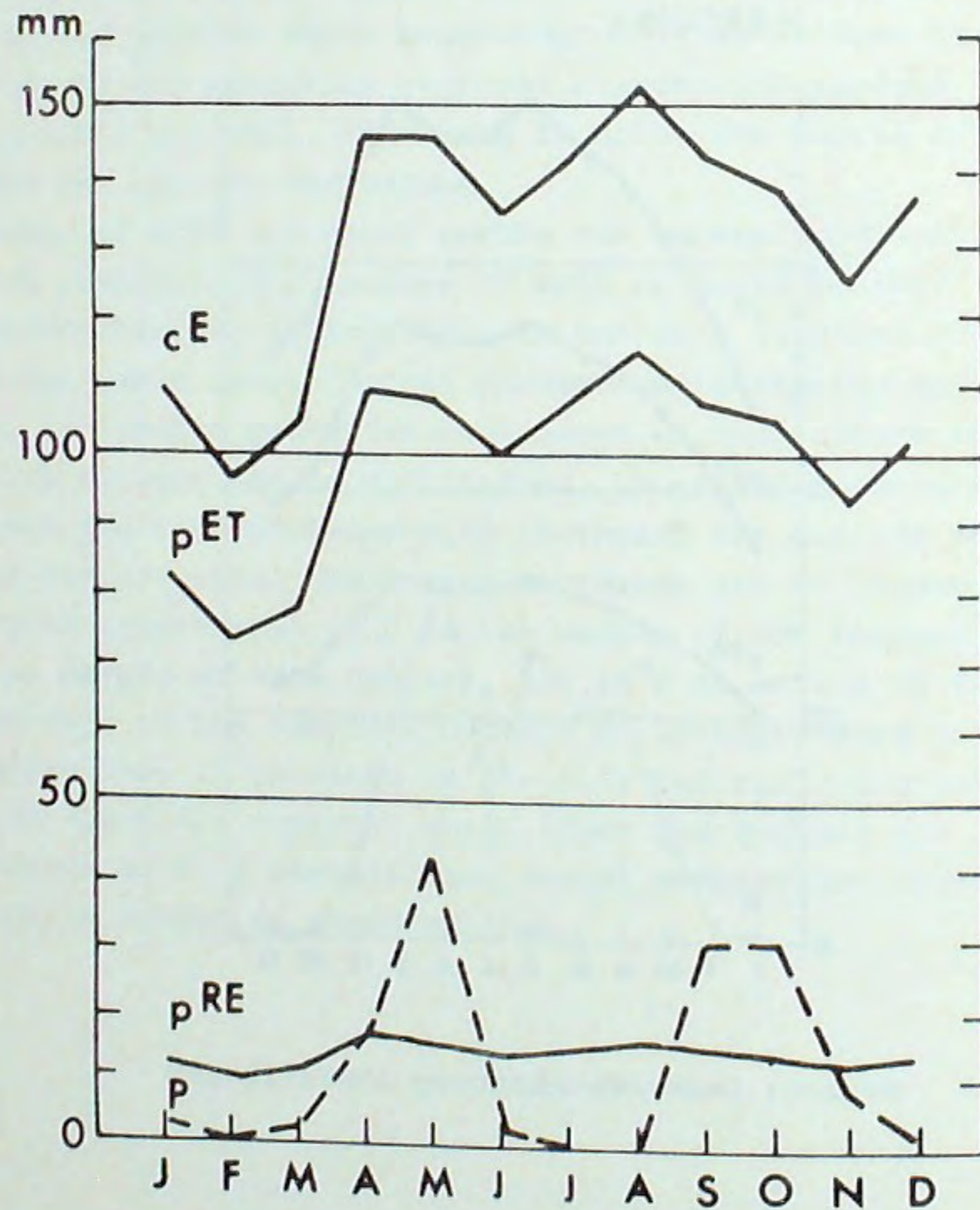


Source: Lauer/Frankenberg 1981:II2-II3

In relation to climatic evaporation, all five places show arid conditions throughout the year. The annual climatic evaporation varies from 1573 mm for Las Anod, 1591 mm for Erigavo, 1917 mm for Hargeysa to 2163 mm for Burao. These values are lower than those reported by Hemming (1966:185) (2382, 2336 mm) from Dagakureh northwest to Hargeysa and

Figure 3. Monthly variations in precipitation and evaporation in Las Anod. For explanation and source, see figure 2.

LAS ANOD

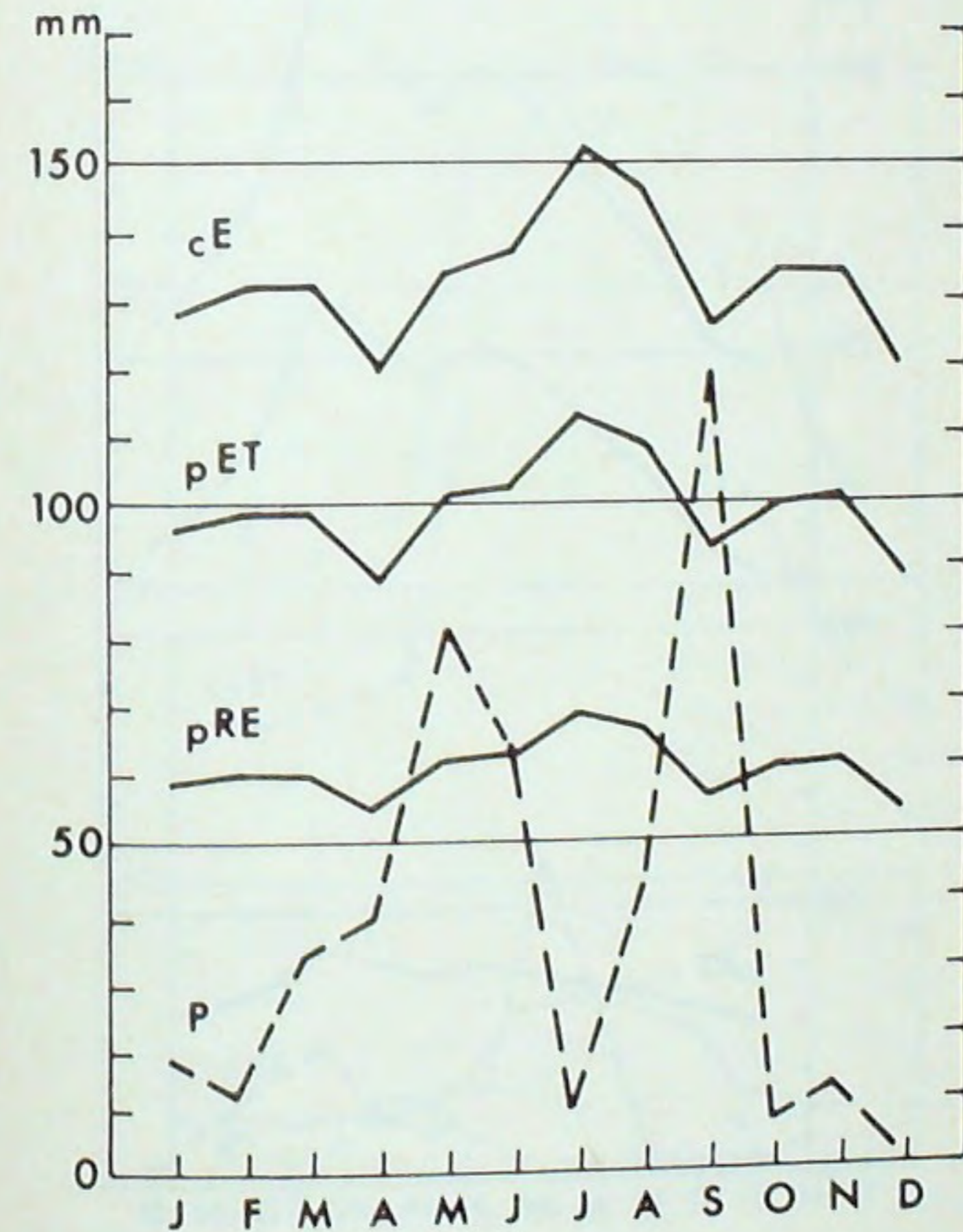


measured from two pans, type A. Only Erigavo shows a humid period (September) in relation to potential evapotranspiration (figure 4).

The geocological conditions vary between the five places. Berbera remains geocologically arid during the whole year. Las Anod, Erigavo and Burao are geocologically humid

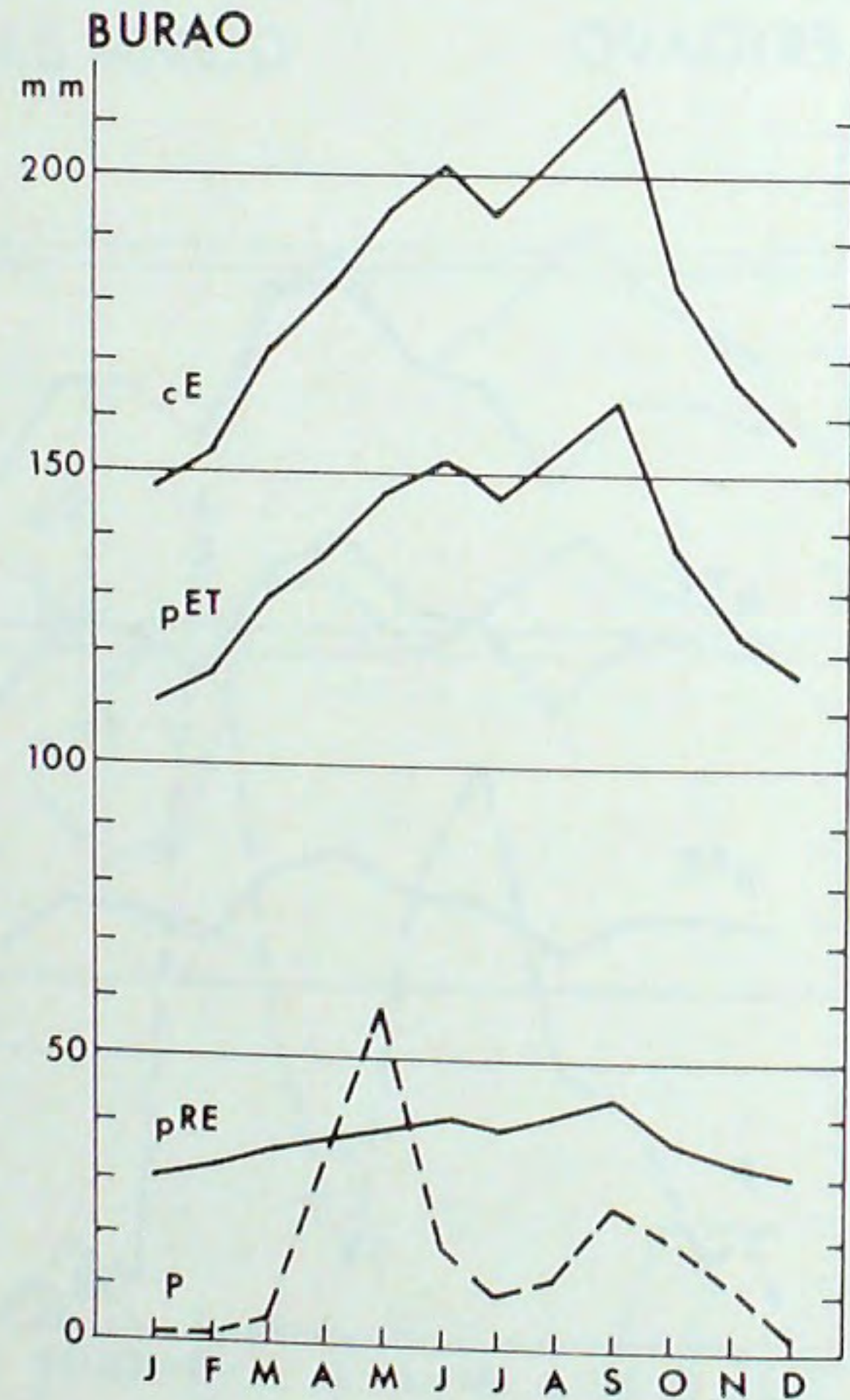
Figure 4. Monthly variations in precipitation and evaporation in Erigavo. For explanation and source, see figure 2.

ERIGAVO



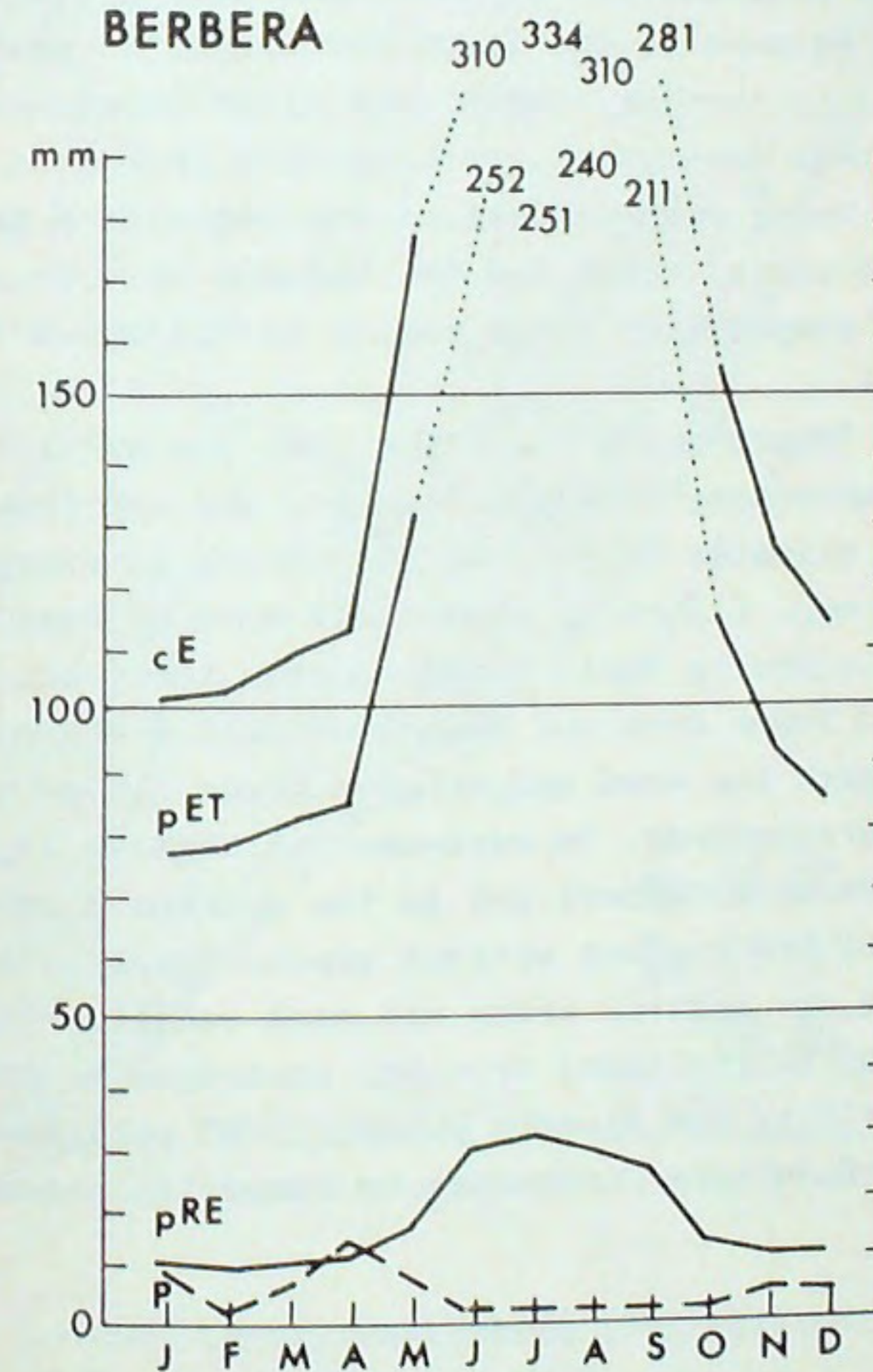
during April - June. This is coincident with the southwest monsoon and the gu-rains. Hargeysa remains geocologically arid during the gu-period. The deyr-rains which occur with the northeast monsoon in August - October are sufficient for geocological humidity in Las Anod and Erigavo and for a balanced water supply in Hargeysa. Burao is geocological-

Figure 5. Monthly variations in precipitation and evaporation in Burao. For explanation and source, see figure 2.



ly arid during the deyr-rains. From the diagrams can also be seen that the humid and arid months not exactly are the same all over northern Somalia - a fact well known by the nomads and used by them in their grazing strategies (Haaland/Keddeman 1981:13; Lewis 1961:36-42). The diagrams show during which months the vegetation exists under water

Figure 6. Monthly variations in precipitation and evaporation in Berbera. For explanation and source, see figure 2.

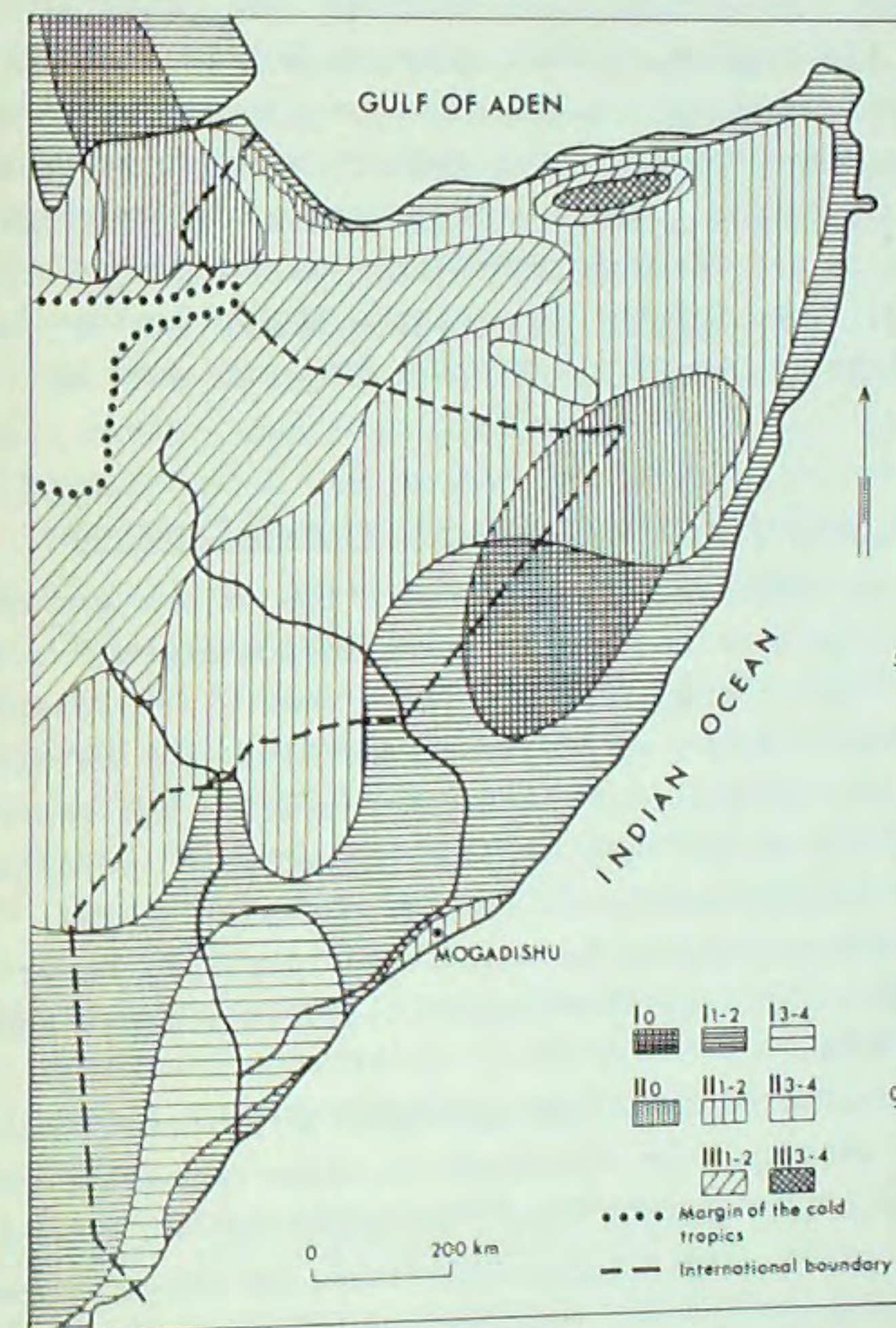


deficit or surplus. In case of deficit, it is possible to estimate how much water is needed for an optimal water supply. This might be of importance for calculations over how much water is needed - for instance for irrigation - on a plain surface to enable an optimal production throughout the year.

The relationship between precipitation and potential regional evaporation is intricate. There is a congruence regionally between the number of humid months and the existing type(s) of vegetation. The vegetation fulfills a decisive function for evaporation but, on the other hand, the rains have been the prerequisite of development of a stable plant cover. Because of the large variations in precipitation from one year to another, the plants might sometimes have to keep up their generative capacity only through a few individuals. Under such conditions the vegetation is very vulnerable to exploitation and the balance between precipitation and evaporation might easily be disturbed (Hemming 1966:177-187).

From the map "Hygrothermische Klimatypen von Afrika" by Lauer and Frankenberg (1981:Beilage 4), the map showing the hygrothermic climates of the Horn of Africa is excerpted redrawn. The map, figure 7, shows that most of Somalia has 1 - 2 geocologically humid months during the year. The region around lower Juba and Shabelle has 3 - 4 humid months and in the north Las Anod and Erigavo areas are more humid than their surroundings. In west-central Somalia (approximately Dusa Mareb - Garowe) and in the extreme northwest (north Borama) are regions without geocologically humid months. These are regions which are most sensitive to exploitation and to prolonged drought. According to the map "Scheme of aridity and drought probability" published 1977 for the United Nations Conference on Desertification, most

Figure 7. Hygrothermic climate regions in the Horn of Africa. I = mean annual temperature 27°C , II = mean annual temperature 24°C , III = mean annual temperature 18°C . The Arabic numbers 0 - 4 indicate the number of geocologically humid months.



Source: Lauer/Frankenberg 1981:Beilage 4

of Somalia has drought probabilities between 50 - 75%, i.e. between 50 to 75 years out of 100 are probable drought years. In southern Somalia (south of the Juba) the drought probabilities are between 30 - 50%. It should be pointed out that the drought in question are drought caused by "land aridity", a complex phenomenon related to water availability for biological production of the ecosystems of the areas concerned. "Land aridity" and "geoecological aridity" are closely related concepts (Kovda 1977:12). The hygrothermic climate regions shown on the map (figure 7) should be interpreted as mean regions based on mean monthly rainfall over a longer period. During different years there can be considerable variations in the geoecological humidity/aridity for the same month. Within regions humid/arid conditions can vary spatially from one year to another.

Potential regional evaporation and desertification

There is no comprehensive study over the extent and gravity of desertification in Somalia (Desertification and ... 1977: 7-8; Haaland/Keddeman 1981:14; Three year ... 1979:42).

Most documents about agricultural and livestock development nevertheless mention rangeland deterioration and desertification as one of the most serious obstacles to development (Economic transformation ...1977:72, 76-83, 260-261; Mohamud 1980:4; Somalia in transition 1975:131; Desertification and ...1977:5; Three year ...1979:42; Short and long term ...1981:144).

During the last decades, the mobility of livestock between different pastures has decreased. A large number of permanent water supply points have been constructed, either privately or on government initiatives. In the neighbourhood spontaneous "nomad" settlements have grown up. The

permanent water supply and more or less permanent dwellings in combination with the livestock owner's increased demand for services have caused that he and his livestock remains the whole year in the vicinity of the permanent water supply. The pastures have no time to recover and will soon be overgrazed. To a more concentrated grazing contributes also the system with enclosure of large areas for fodder production. The fodder is either sold to harbour of Berbera where it is used to feed export animals, or for feeding the owner's own livestock. Through the enclosures, the stock routes also become more concentrated with serious trampling as a consequence (Omar/Awaleh n.d.:12-18, 23-42; Abdi 1978:24).

The problems with rangeland deterioration and desertification are gravest in northern Somalia, especially in the Hargeysa - Burao - Las Anod area. The north was also that part of Somalia which was hardest stricken by the 1974 drought. The problems in the central rangelands are not assessed as serious, mainly due to less pressure on the pastures (Bulletin on current ...1974).

According to the "World map of desertification" (1977), the southern part of Togdheer and the western parts of Mudug and Galgadud are areas where the risk for desertification is very high. The rest of northern (except Tug Wajale, which is classified as moderate risk) and central Somalia are high risk areas.

To assess the connection between desertification and the regional potential evaporation a definition of desertification is needed. One widely used is the one by Dregne (Olsson 1983):

"the impoverishment of arid, semi-arid and sometimes sub-humid ecosystems by the combined impact of man's activities and drought. It is the process of change in these ecosystems that can be measured by the reduced

productivity of desirable plants, alterations in the biomass and diversity of the micro and macro flora and fauna, accelerated soil deterioration, and increased hazards for human occupancy."

From the definition can be seen that the desertification process will influence most of the components in the re-education factor used by Lauer and Frankenberg: the soil : plant ratio, the transpirational behaviour, the albedo and the edaphic factors. The potential regional evaporation will decrease and the surface run off increase. From a regional point of view, changes in albedo probably are most important. When the vegetation cover of the ground is destroyed totally or partly, the ground becomes lighter and the albedo is increased. The precipitation in arid areas is convective and depends on the ability of warm air to rise freely until its moisture can be released from clouds. If the albedo of a region is increased, for example by removing vegetation or trampling, less solar radiation will be absorbed during the day, there will be less heating and as a consequence, a reduction in convective activity in the atmosphere.

Obviously there have been some changes in the rainfall pattern in northern Somalia during this century (Abdi 1978: 25-26; Hemming 1966:177-178). The exact nature of these changes are hard to assess. The nomads express the feelings that also during "rainy" years, there is less rain today than it used to be, and that the spatial and temporal distribution of rainfall has changed. "It used to rain in this area, but nowadays ...", "Haud was our best pastures, but look today ..." (personal communication, several informants).

Rural development project design in arid regions

Somalia, like most other African countries, is a project planning country. The diversity and fragility of arid environments make planning difficult and serious mistakes are easily made. As mentioned earlier, most rural development projects are dominated by economic and technological aspects while the environment with its resources is looked upon as something neutral which can be developed by rational techniques. In this type of philosophy, the ideal is large scale, high technology projects that produce fast results. This type of thinking is behind many of the disasters produced by wrong project planning in Africa, and is definitely not suitable in poor arid countries like Somalia. Under such conditions it is important that instead of economic and technological aspects, environmental aspects come to the front. This means also that the development projects should have a very strong local connection and not be based on ideas developed in urban centers or even abroad. The diversity of the arid environment makes cooperation with local people a condition for successful project design and implementation. The knowledge the local people have about their environment is such that it will be impossible to gain the same insight through however detailed preproject studies. Especially the knowledge about the ecological conditions is well developed among local inhabitants. Often, perhaps, the folk ecology might appear unscientific, but detailed investigations from for instance West Africa (Warren 1976:177-189) have shown a great deal of significance behind folk ecological thinking. The Somali nomads have their own ecologists who traditionally had to follow the conditions of the pastures, the quality of the water and generally to give advice in matters concerning livestock rearing (Musa 1968:6-7). The folk ecology is a field

which is not yet explored in detail, but which probably could contribute a great deal to the understanding of the diversity in the Somali environment.

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Hubert Laux

SOME ASPECTS ON THE USE OF FUELWOOD AND CHARCOAL
IN SOMALIA

Introduction

During the 1970s there were two main energy crises concerning the Third World countries. First, the oil crisis which seriously affected the payment balances of many industrial countries as well as most of the developing countries. And second, the fuelwood crisis which may be called the real Third World energy crisis. It is especially a crisis for the poor people. In general, its consequences are known very well: ecological damages which often lead to desertification on the one hand, and social and economic problems for the respective population on the other. What about these problems in Somalia? Are there any wood-fuel shortages? To what extent do they arise? Which are the concerned regions and locations? In which way is the population affected, and which are the environmental consequences? It is impossible to give a complete or even detailed answer to these questions up to now. Due to lack of data even general informations about the energy situation in Somalia mainly depend on estimates. This paper is mainly based on some reports about the energy situation in Somalia (Openshaw 1982; Engergy/Development International 1982) complemented by a few own impressions gathered during a short stay in Somalia in March/April 1983. The paper is divided into four sections. First I give an overview about the energy consumption in Somalia and some general informations about demand and supply of woodfuel. The second part deals with some aspects of woodfuel shortages

presented by a few examples of the most seriously affected areas. The third part will be a short discussion of possible solutions. And in the last part I will present a summarized proposal of a fuelwood and charcoal survey I intend to do in Somalia.

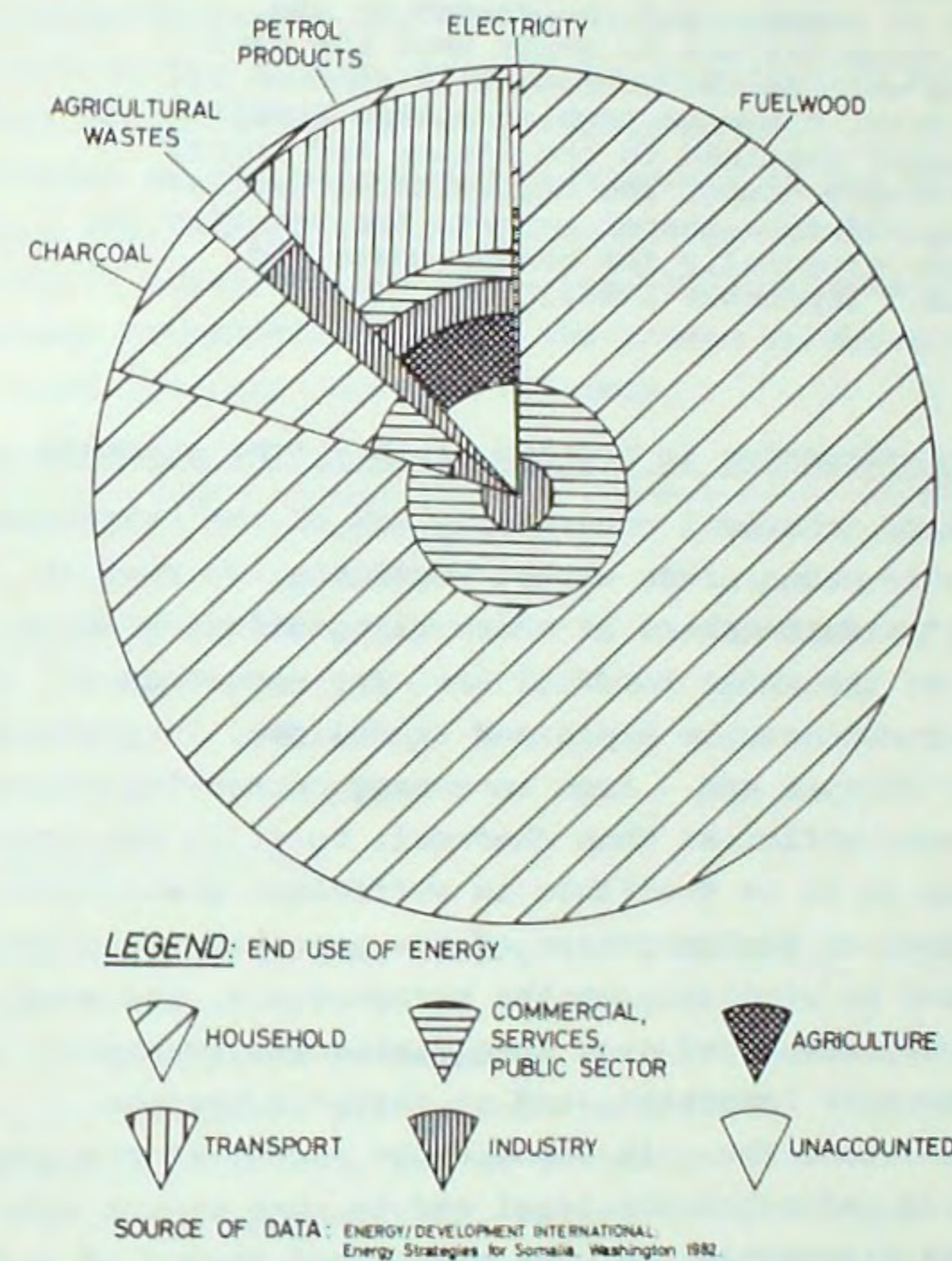
The energy situation in Somalia

Figure I shows the estimated energy consumption in 1980 by fuels and by end use of energy in units of terajoule (1 TJ = 10^{12} joule). About 80% of the whole consumption is covered by fuelwood. In addition, charcoal constitutes another 6.5%, whereas the share of petrol products is 11.5% in total, that of electricity is only 0.3%.

The end use of energy shows a comparable picture. More than 80% are used as household fuel, while the uses for transport as well as for the commercial, service and public sector lie between 6 and 7 per cent each, and the amount of energy use in industry is less than 3%. Comparing both, fuel and end use, one can see that about 94% of fuelwood and 85% of charcoal, but only 5% of petrol products are used as household fuels. So households are dominating the demand of energy, and they mainly use woodfuel, whereby fuelwood is mainly a rural fuel, and charcoal is almost exclusively an urban fuel (Openshaw 1982:5).

An estimate for the supply of wood and the comparison between supply and demand of wood products can be taken from Openshaw (1982:8-10), who estimated a total growing stock of forest, woodland and bushland of approximately 800 million m^3 . If an annual yield of about 2.5% of the total growing stock can be assumed, the estimated yield would be approximately 20 million m^3 , whereas the estimated demand of woodfuel is only a bit more than 5 million m^3 roundwood equiva-

Figure I. Estimated Energy Consumption in Somalia by Fuel and End Use, 1980 (Unit: Terajoule)



lent. Considering that 10% of the whole wood consumption are needed for other uses than fuel, the total consumption of wood is about 5.8 million m^3 - much less than the total supply. As noted above, these results are only based on estimations and therefore should be used very carefully.

But even if the real figures differ to some extent, it can be pointed out, that today there are no general shortages of woodfuel in Somalia. But nevertheless,

"shortages occur where there are concentrations of people, and the demand on the tree resources are so great that the capital as well as the increment is removed ... Therefore, the wood problem facing Somalia is mainly confined to the cities and towns, the refugee camps, the agricultural settlements, and to a lesser extent, the watering points, especially for sheep, goats and cattle." (Openshaw 1982:10)

The woodfuel situation in problem areas - some examples

In units of TJ, charcoal covers only 25% of the estimated consumption in urban areas except Mogadishu, whereas in Mogadishu itself the share of charcoal constitutes about two thirds of the whole woodfuel use. The occurrence of these differences can be explained as follows. In general, fuelwood is cheaper and - from an energy conserving point of view - more efficient than charcoal. So it is the usual fuel as long as it is available in sufficient quantities. But the bigger an agglomeration of the population and the less fuelwood is available in the surroundings, the more fuel must be transported over long distances. Transport costs become more important, and so charcoal becomes cheaper than wood. Thus, in Somalia the amount of charcoal use can be an indicator for local and to some extent also for regional disparities between supply and demand of woodfuel.

Production, transport and sale of charcoal are mainly done by cooperatives. In the regions Bay, Baqool, Hiran, Lower and Middle Shabelle, and Benadir, the production takes place in 114 charcoal camps belonging to the cooperative Cadceed. More than half of the camps are located in the Bay region.

Usually 15 up to 30 permanent workers are occupied in each camp. The produced charcoal is transported to the place of destination by Cadceed and handed over to the local consumer's cooperatives. In Mogadishu there are 342 charcoal stores belonging to the cooperative Hilaac. Up to now, the amount of woodfuel shortages in Mogadishu cannot be specified directly. One possible indicator of such shortages is the amount and development of the prices. But only a few, rather inexact informations about the charcoal prices in Mogadishu are available. By informations of the charcoal cooperative Cadceed the prices in Mogadishu during the last ten years were as follows:

period	official	black market
1973 - 1975	18 SoSh/qintal	30 SoSh/qintal
1975 - 1976	20 SoSh/ "	60 SoSh/ "
1976 - 1978	25 SoSh/ "	80 SoSh/ "
1978 - 1980	30 SoSh/ "	100 SoSh/ "
1980 - 1981	50 SoSh/ "	180 SoSh/ "
1981 - 1983	70 SoSh/ "	300 SoSh/ "

(1 qintal = 100 kg)

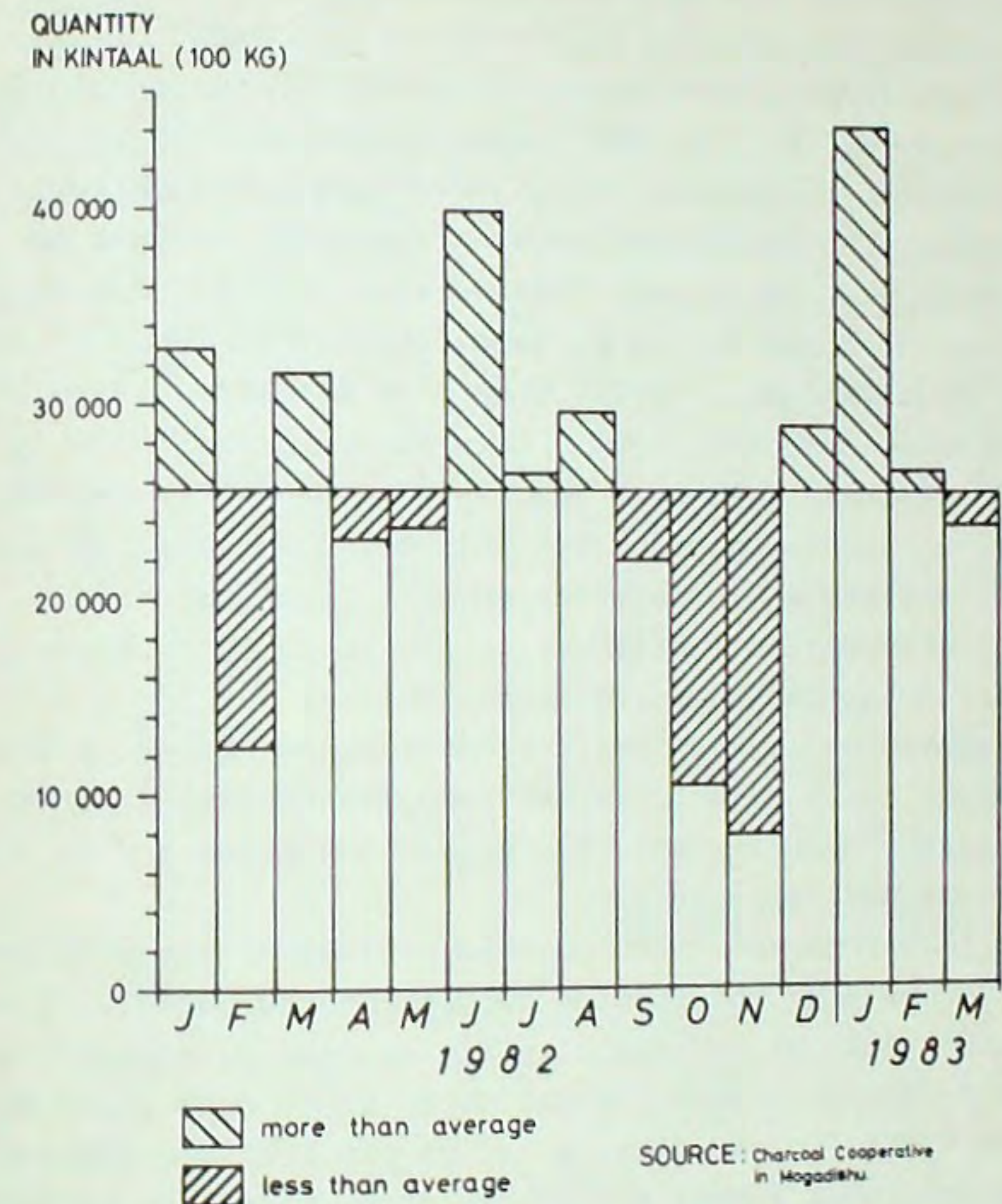
The rise of the prices during the last ten, and especially during the last five years, and the increasing discrepancy between the prices recommended by the cooperative and the given black market prices seem to indicate a growing shortage of charcoal. But no definite statement is possible by only these informations, unless the inflation rate during this period is not known. Furthermore, these figures do not give any informations about the seasonal differences of the prices, about the influence of the quantities bought on the paid prices, and about the percentage of charcoal sold in the cooperative stores and sold on the legal free market and on the black market.

For June 1982, Openshaw (1982:34-35) gives a price of 175 SoSh per qintal in case of buying big quantities of charcoal and a comparable price of approximately 400 SoSh per qintal, if only a few pieces are bought. Although there are supposedly price differences due to the quantities bought, these figures are nearly useless. He compares a small amount bought on the market with a big amount bought in a cooperative's store, without considering that the cooperative's charcoal is sold with fixed prices, no matter what quantities are bought.

As mentioned before, most of the charcoal production is done under control of the cooperative Cadceed, but nobody really knows the share of charcoal that is produced by private persons. But there seems to be a growing number of private charcoal producers. At the beginning of April 1983, between Jowhar and Bulu Burti, sacks of charcoal could be seen at most of the villages along the road. For example, at one of these villages 40 sacks of charcoal were offered by 8 different persons, all of them peasants who started producing charcoal two years ago due to the rise of the charcoal prices. One sack was usually sold for 80 SoSh either to private consumers or to dealers who resell most of it in Mogadishu.

Are there also seasonal differences in the supply of charcoal enlarging the supposed shortages? Figure 2 shows the amount of charcoal monthly transported to Mogadishu by Cadceed. Notable differences can be seen between the dry and the wet seasons. Especially in the dry season 1982 (October and November) the amount was very low. The main reason for these differences is the transport problem due to the heavy rainfall in the rainy seasons. At the same time most of the peasants producing charcoal additionally to the cooperative are busy on their own fields, and so the amount of charcoal offered by peasants may also be lower than in

Figure 2. Monthly Quantity of Cooperative's Charcoal transported to Mogadishu, January 1982 - March 1983



dry seasons.

After these examples for the energy situation in Mogadishu, I come to the second kind of problem areas, the refugee camps. In Somalia there are more than 30 refugee camps in seven different areas. Even today they cover an estimated population between 400,000 and 700,000 persons.

By assertions of some residents in the Jalalaqsi camps, fuelwood could be found in the nearest surroundings of the camps five or six years ago. But today all trees and bushes around the camps are cut off, and people have to go distances of ten or more kilometer to find enough fuelwood. Even more serious is the situation in the camps close to Belet Weyn. In July 1980 people had to move up to 40 km for the collection of fuelwood (Lewis/Wisher 1981: I3). Since then the situation even worsened, so that in some camps the scarce vehicles and even scarcer rations of diesel or gasoline had to be used to bring fuelwood to the camps (Lewis/Wisher 1981:I3). The same situation arose at the camps of Qoryoley. People have to go more than 10 km to collect their fuelwood. That is why only an estimated 10% of the camp population are collecting fuelwood by themselves, whereas a big majority buys it from businessmen. It is estimated that a family has to pay about 25 SoSh per week for fuelwood (personal communication).

These shortages are seriously affecting the host population around the camps as well as the refugees themselves. But especially concerning the host population there are no informations available at all.

Due to these enormous problems and ecological damages, the Somali government and foreign donors reacted quickly. First, different kinds of mud and clay stoves were introduced and are used instead of traditional three stone open fires in all the camps. In addition, a lot of projects are started to improve these stoves and to train the people in building up clay stoves by themselves. Depending on the kind of stove, it is possible to conserve 30% to 50% of the fuelwood needed for cooking at an open fire. Second, in July 1981 afforestation projects for the refugee camps were started under the responsibility of the National Refugee Commission and the National Range Agency in cooperation with different

foreign donors. The main purpose of these projects is the constitution of fuelwood plantations. The projects are divided into two phases. In the first phase - from July 1981 up to July 1982 - different species should be tested, while in a second phase - with the help of these experiences - the projects were to be extended over larger areas (Somali Democratic Republic 1980:III-I56).

Visiting the project at Qoryoley in March 1983, the tests were not yet finished. It was impossible to get any definite results about the yields and the efficiency of different kinds of trees within such a short period. At that time the project was somewhere between the first and the second phase, still continuing with tests and starting to enlarge the planted areas. Different imported fast growing trees, such as leucaena leucocephala, different kinds of acacia and eucalyptus, and some local trees, such as nim, are tested in the main. Most of these trees can be utilized for fuelwood after only two or three years. But, on the other hand, they require very much water. Additional irrigation must be applied for at least half a year. And up to now, no experiences exist as to planting fast growing trees over longer periods. At the project in Qoryoley about 100 ha were planted or prepared, ready for planting in March 1983. In the long run, it is intended to expand the planted areas up to 400 ha or 600 ha, which should be enough for about 60.000 refugees.

Possible solutions

Possible solutions can be subdivided into three approaches: energy conservation, increase of energy supply and improvement of the transport system.

Energy conservation

The attempts in fuelwood conservation by introducing and

improving mud and clay stoves, as already practiced in refugee camps, are a first step in the right direction. In the future, those projects should also reach the host population near the refugee camps and the peasants in agricultural settlements who still use open fires. Furthermore, investigations should also be made to find out if fuelwood and charcoal could be saved even in towns and cities by improving the existing stoves. Attention should be given to the improvement of charcoal production too. Up to now it was assumed that charcoal is produced throughout the country with traditional, rather inefficient methods. But a project which has the aims to measure the efficiency of the charcoal production and, if necessary, to improve the production techniques, already started in April 1983 in the Bay region, may lead to differing results.¹

Increase of energy supply

For the increase of energy supply, there is a wide range of possible actions, like the increase of woodfuel production, the conversion of agricultural wastes into fuels like coke or gas, the use of other renewable energy, and the increasing use of fossile fuels. But only the first action mentioned is useful to satisfy the household's main energy demand. Up to now it is not known, if the conversion of agricultural wastes into fuels is practicable from an economic point of view. The use of other renewable energy, such as wind and solar power, requires a better adaptation to the situation in Somalia. Besides, these energy sources are better suited to produce electricity, whereas in the foreseeable future the main energy required by households is any kind of fuel. And the use of fossile fuels would be meaningful only, if they could be found in Somalia itself. Otherwise it would burden the payment balance and enlarge the dependence on foreign countries unnecessarily. As noted above, the founding of fuel plantations was started

two years ago, in order to provide the refugee population with fuelwood. To meet the increasing demand for woodfuel, especially in the towns and cities, it will be necessary to establish fuelwood plantations for this purpose. However, such a far-reaching expansion of wood plantations as recommended by Openshaw could lead to other problems. He assumed that in the year 2000 at least 75% of the whole woodfuel demand in cities and towns, agricultural settlements and refugee camps should be taken from plantations and woodlots. And he estimated that an area of 0.6 million ha would be necessary for this purpose (Openshaw 1982:15-16). In order to minimize the transport costs, these areas must be close to the centres of demand. In consequence, land use conflicts and conflicts about the usage of the limited water supply would occur.

Improvement of the transport system

As local shortages are often a problem of transport only, some efforts should be made to improve the transport system. Especially in refugee camp areas it is necessary to introduce an adequate transport medium. Refugees mainly collect their fuelwood on foot or buy it from businessmen, transporting the wood with lorries. But in the refugee camps I visited I did not see any donkey cart used for fuelwood transport. The use of donkey carts or camels could not solve the problems of shortage in the long run, but it could at once mitigate the continuing ecological damages. People who are transporting wood by themselves can only take limited quantities. They need only one tree or a few bushes for one collection, and because the transport is the hardest part of their work, they try to minimize the transport distances. Therefore they cut off all trees and bushes close to the camps. Even the young species with little efficiency are used as fuel. In opposite, people using a donkey cart are not only able to go for longer distances;

they are also able to transport bigger quantities. Therefore, they are looking for greater agglomerations of wood. Young inefficient trees are of less interest and will not be cut. And so the complete cut off of an increasing area around the camps could be stopped. Furthermore, a few people using donkey cart could be easier encouraged to take care of ecological problems than a lot of people collecting on foot, who are unable to stop ecological damages - even if they would like to do so.

Summarized proposal on a woodfuel survey

The former presentation leads to the point that it is impossible to make any definite statement about the energy situation in Somalia up to now. There are not even reliable and detailed informations about some single aspects available. Therefore - although necessary for different purposes - it is not possible to draw up a national energy balance for Somalia unless a lot of basic empirical work will be done. This research work has to be started with case studies on the lowest level. It must not only lead to more exact data, but also deal with methodological problems in collecting data in Somalia. And, last but not least, the reliability of the data and possible sources of errors that will be inevitable at the beginning should be discussed very comprehensive.

With a survey about the production, marketing and consumption of woodfuel in Mogadishu, I intend to do one small step to get some more reliable informations about different aspects of the energy situation in Somalia.

In a theoretical part I intend to work out a framework of a national energy balance for Somalia that should be filled with data in the long run. Such a national energy balance must be useful at least for the following purposes:

- to determine actual supply/demand imbalances;
- to provide supply/demand forecasts with reliable data;
- to be a useful basis for plannings in the energy sector.

An energy balance that should meet these purposes must not be a merely comparison of energy supply and demand on a high level of aggregation. As shortages in Somalia are supposed to occur on lower levels, for example in certain locations or for certain groups of the population or for special economic sectors, an energy balance should be disaggregated to such a low level.

The empirical part of my survey bases on the hypothesis already named above. On the one hand today and in the foreseeable future there will not be any woodfuel shortage for Somalia as a whole, on the other hand there do probably occur increasing shortages at least on the local level.

With an estimated 10% up to 15% of the total population of Somalia, Mogadishu is not only the largest agglomeration of the population, but also the most important consumption area. It is assumed that Mogadishu is one of the major problem areas, concerning the woodfuel supply. And due to the rapid increase of its population, occurring woodfuel shortages may even become more serious in the future. The information of my basic questions can be divided into three parts:

- I. Supply of woodfuel - From which areas is Mogadishu supported with fuelwood and charcoal? Did these areas change in time? It is assumed that especially the centres of the legalized charcoal production by Cadceed moved farther and farther away from Mogadishu during the last eight or ten years. If so, what are the reasons for this change? Was there any far reaching process of deforestation in the areas closer to Mogadishu or is it only an action against deforestation, a temporal stop until the vegetation has regenerated and the production can be

started again?

What about the charcoal production by private persons and the collection of wood? The number of private producers seems to grow rapidly, and they produce in the areas which are not or no longer suitable for the production by Cadceed. The collection of wood is mainly done in the areas closer to Mogadishu. Who are the charcoal producers and the wood collectors and which are the exact production/collection areas? Do these people care about ecological problems? Is there any control in order to prevent a process of deforestation or is it a totally uncontrolled and unguided production and collection?

2. Transport and marketing system - While there are at least a few informations available about the transport and marketing of the cooperative's charcoal, almost nothing is known about the other parts of the marketing system. Which are the different components of the marketing system, who are the people engaged in woodfuel trade, and which connections and dependent relations are existing between these components?

A very important aspect is the development of the woodfuel prices. How did the prices change in time, which are the price differences between the single components of the marketing system, and which are the factors influencing the price structures?

3. Consumption of woodfuel - The third aspect of my survey is the consumption of woodfuel. As named above, charcoal is the most important household's fuel in Mogadishu. But nobody actually knows the real percentages of fuelwood and charcoal used. And nothing is known about the kinds of fuel used by different groups of the population and the factors influencing the quantities used. The crucial point of this part of the survey is to get the consumption figures for private households in selected areas of Moga-

dishu. These areas should be somehow typical for Mogadishu, but due to a lack of other informations, such as an economic differentiation of the population, it is not intended to get data that are representative in a statistical way.

This survey will not lead to a complete picture about the woodfuel situation of Mogadishu. It should be rather seen as the beginning of a research work that has to be done over a longer period.

FOOTNOTES

- I Project under CDA (Corporation for Development of Africa), a program in cooperation with the National Range Agency, done by Alan Robinson. His preliminary results lead to the point that the charcoal production in the Bay region is far more efficient than anybody imagined up to now.

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NOTE ON CONTRIBUTORS

- Abdulkadir H. Deriye Training Officer
Islamic Development Bank
P. O. Box 9201
Jeddah / Saudi Arabia
- Bechtold, Karl-Heinz Head, Dept. of Economics, Social
Sciences and International Law
Institute for Scientific Co-operation
with Developing Countries
Landhausstraße 18
7400 Tübingen / Federal Republic
of Germany
- Benvenuti, G. Professor
University of Padua
Padua / Italy
- Faillace, Costantino Hydrogeologist
Via Fontana dei Monci Prima, 7
Ciampino / Italy
- Gatti, G. Professor
Politecnico Milano
Milano / Italy
- Hassan Awad Duaale Research Assistant
Somali Academy of Sciences and Arts
P. O. Box 1228
Mogadishu / Somalia
- Helander, Bernhard Graduate Student in Cultural Anthro-
pology
African Studies Programme
Dept. of Cultural Anthropology
Trädgårdsgatan 18
75220 Uppsala / Sweden
- Helming, Stefan Economist
Stadtwaldallee 3a
4420 Coesfeld / Federal Republic of
Germany

- Hjort, Anders
Assistant Professor
Scandinavian Institute of African
Studies
P. O. Box 2126
75002 Uppsala / Sweden
- Ibrahim Mahamed Farah
Research Assistant
Somali National University
P. O. Box 15
Mogadishu / Somalia
- Janzen, Jörg
Lecturer
Institute for Anthropogeography
Freie Universität Berlin
Grünwaldstraße 35
1000 Berlin 41
- Krokfors, Christer
Lecturer
Dept. of Human Geography
University of Uppsala
P. O. Box 554
75122 Uppsala / Sweden
- Laitin, David D.
Associate Professor of Political
Science
Dept. of Political Science
University of California
La Jolla, Cal. 92093
- Laux, Hubert
Assistant Professor at the Technical
University Munich - Geographical
Institute
Berliner Str. 73
6368 Bad Vilbel / Federal Republic
of Germany
- Mohamed Ali Hussein
Researcher
Somali Academy of Sciences and Arts
P. O. Box 1228
Mogadishu / Somalia
- Omar Osman Rabeh
Researcher
8, av. Youri Gagarine
93270 Seuran - Paris

- Osman M. Fadal
Advisor to the Minister of Local
Governments and Rural Development
of the Somali Democratic Republic
P. O. Box 1766
Mogadishu / Somalia
- Pozzi, R.
Professor of Applied Geology
Dept. of Earth Sciences
University of Milano
Via Mangiagalli 34
Milano
- Putman, Diana B.
Anthropologist
1676 A Euclid Str. NW
Washington, D. C. 20009
- Schopfer, Nikolaus
Economist
Königsteiner Straße 147
6232 Bad Soden / Federal Republic of
Germany
- Varotti, Adriano
Associate Professor of Urban and
Regional Sociology
D.A.E.S.T.
Ca'Tron
S. Croce 1957
Venice / Italy