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# THE PHILIPPINE GEOGRAPHICAL JOURNAL

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## **EDITORIAL**

### **QUO VADIS METRO MANILA?**

This is an opportune time to voice our stand on the fate of the Metropolitan Manila Area — whether to centrally administer it under a metropolitan government or to disband its 4 cities and 13 municipalities to function as separate, autonomous local political units. These are the polarized positions now of the Philippine Senate and House of Representatives, as contained in their respective proposed bills, on what to do with the Metro Manila that the Marcos administration had fashioned and abandoned. As these positions are being debated towards the formulation of a compromise bill, we would like to share some thoughts on the matter and stress the import of the controversy to Metro Manilans and the whole country.

#### **The Old Metro Manila Commission and its Failings**

Before the EDSA People Power Revolution in 1986, Metro Manila was administered by the Metropolitan Manila Commission (MMC) with the Philippines' then First Lady, Imelda Marcos, as Governor. As provided for in Presidential Decree (PD) 824, the Commission was composed of a Chairman or Governor, a Vice-Chairman or Vice-Governor, and three Commissioners or Board Members, one for planning, another for finance and a third one for operations. In PD 824, the Governor was supposed to defer to the Commission with regard to the execution of policies and measures set up by the Commission, i.e., to act only as manager or executor. But as it was, the commissioners did not function as a powerful collegial body and merely acted as assistants to the Governor or, as one newspaper columnist puts it, were merely reduced to being her "errand boys." There was clearly *a lack of institutionalization of the relationships between the Governor and the Commission*. Imelda Marcos ruled by whim and this administrative arbitrariness and non-rational decision-making points to the *lack of a system of countervailing forces*. Unlike in other metropolitan governmental structures where there are checks and balances, in the actual functioning of the MMC these were absent. No person or body could review the First Lady's decision. The system of countervailing forces is the essence of a democratic way of metropolitan governance and of the vital principle of citizen participation. This lack of countervailing forces leads to the concept of *lack of accountability*. No body, agency or group had the power to hold the First Lady account-

able for most of her costly ventures. As many were fully aware, the First Lady did not consider costs in her many projects, which if subjected to simple cost-benefit analysis would be shown to be non-viable. For on the whole, the MMC was used by Marcos and his wife as a machine for electoral and political mobilization as well as a source of political patronage. These were the failings of the MMC which as "the symbol of the abuse and lavishness of the then First Lady," according to the incumbent mayor of Manila, is currently generating a heated controversy among the country's politicians — whether to change its structure or to abolish it altogether.

### **The Current Proposals on the Metropolis' Fate**

It must be mentioned that the present Constitution which was promulgated in 1987 right after the 1986 February Revolution provides that "Congress may, by law, create special metropolitan political subdivisions, subject to a plebiscite..." Thus, currently debated upon are three bills addressing the provision — House Bills 40 and 1996 and Senate Bill 34. House Bill 40 of the House of Representatives proposes the abolition of the MMC and the return of 12 Metro Manila towns back to Rizal Province and Valenzuela town back to Bulacan Province. The bill, in effect, eradicates Metro Manila as a geographical and political entity as the constituent units become autonomous. The bill's proponent opines that the MMC has left the once wealthy province of Rizal "impoverished." Actually, many see his move as a means to boost the clout of Rizal politicians.

Senate Bill 34 is practically the opposite of House Bill 40 since it proposes the retention of Metro Manila as a political subdivision, even as it seeks to abolish the MMC and create in its place a Metropolitan Manila Authority (MMA). The MMA would be governed by a Board of Directors composed of the mayors of the 4 cities and 13 municipalities of the metropolis. The Board would elect from among themselves a Chairman who will be backstopped by a professional manager to be appointed by the President. A Chief Executive Officer would run the day-to-day affairs of the Authority. The bill seeks to vest the Board with powers to adopt policies for the coordination of traffic engineering and management, fire and flood control, public safety, health and sanitation, food and water supply and distribution, and housing and urban development. A corollary power is the authority to review ordinances passed by the various city and municipal councils. In terms of funds for operation, the bill seeks to clothe the MMA with tax powers similar to those given to the provinces. In addition, the constituent towns and cities would be required to contribute 15 percent of their annual budgets while the towns would remit 5 percent.

House Bill 1996 is similar in many ways to Senate Bill 34. Its main

difference is that aside from the mayors of the 4 cities and 13 towns in Metro Manila, the MMA Board of Directors would be expanded to include one representative from each of the 22 congressional districts in the metropolis. The representative would be appointed by the President from two nominees of the congressman of the district. The proponents point out that this will help provide balanced or proportionate representation as large political units with more districts would correspondingly have more representatives, unlike in Senate Bill 34 where each local unit as represented in the 17-man Board has only one representative/vote regardless of its size. House Bill 1996 further proposes that the general manager would also serve as Chief Executive Officer, unlike in Senate Bill 34 where these two positions are separate. While both bills guarantee the full autonomy of the Metro Manila local governments in non-metropolitan matters, House Bill 1996 does not require the review of local government ordinances and resolutions by the Board and merely requires the cities and towns to furnish the MMA with copies of such documents. In terms of legislative powers, House Bill 1996 limits the Board only to the enactment of ordinances on matters of common interest to all metropolitan units or those which affect two or more units. The main source of operational funds would be contributions from constituent units equivalent to "10 percent of their regular fund sources and 50 percent of all fees and charges for services directly rendered by the MMA." As in the Senate version, House Bill 1996 would also clothe MMA with taxing powers similar to those of the provinces.

#### **The Interim Metropolitan Manila Authority**

While these three bills were being discussed, President Aquino issued Executive Order (EO) 392 on January 9, 1990 in response to a constitutional provision empowering her to create an interim authority pending the enactment of a law for the purpose. Thus, an interim Metropolitan Manila Authority has been set up which is governed by a Metropolitan Manila Council composed of the mayors of the 4 cities and 13 municipalities of Metropolitan Manila. There is a Chairman who is elected from among the mayor-members of the Council for a term of six months. The Council is assisted by a professional Metropolitan Manila Manager and three Deputy General Managers who are all appointed by the President. It may be observed that EO 392 incorporates most features of Senate Bill 34 and House Bill 1996 as well as features of the old MMC concerning three professional assistants to the Chairman. The features of the two bills particularly reflected in the interim MMA are the power to review the legislation of local legislative assemblies and the mandatory remittance by local treasurers of revenues and receipts accruing to the MMA.

#### **Why the Need to Metropolitanize**

Our position on the matter is that *a Metropolitan Manila Area should be recognized as a politico-geographical unit or as a region and that it*

*should be governed by a metropolitan government.* This need for an integrative governmental structure is based on the major premise that there are problems whose effects go beyond the confines of one municipality and that need, therefore, the attention of a bigger governmental body to coordinate the solutions of such problems or to provide services that demand area-wide action. Services that cannot be provided on a purely local basis include, among others, fire protection, land use planning, rubbish collection and disposal, police services, transportation, public health, housing and relocation, and even public recreation and libraries. A second reason for metropolitanization is the need to deal with declining fiscal bases of the central city and its satellites, as well as increasing social service burden. Thirdly, there is a need to redress the inequalities of public needs and resources among the various sectors of a metropolitan area. Fourth, metropolitan organization will redound to economies of scale in major urban services, as in the use of finances, equipment, land and skilled personnel in urban government. Fifth, a stronger bargaining power is provided if there is one leader, rather than a multiplicity of representatives, to speak for metropolitan concerns. Thus, it is seen that metropolitan governance is really geared towards metropolitan and national socioeconomic development as a whole and not simply urban service maintenance.

Our study shows that the MMC, despite its inadequacies during Imelda Marcos' administration, could lay claim to accomplishing, albeit not too satisfactorily, some of the objectives which metropolitan governance seeks to attain. For one, after the integration of Metropolitan Manila in 1975, the declining fiscal bases of local government units appeared to have improved with slight increases in incomes. Second, disparities in resource/income distributions among individual units appeared to have lessened. Third, the social service burden of the local administrative units appeared to have been reduced and somewhat proportionately distributed with the metropolitanization of services like garbage collection and disposal, and land use planning. Not a few observe that, in fairness to her, Imelda Marcos should be credited for these modest accomplishments that were the cumulative results of those times when she heeded good advice. However, they also add that these were realized mostly because of her unique arbitrary powers as First Lady — powers that could cut bureaucratic corners and produce quick results.

#### **The Suggested Governmental Structure for Metro Manila**

To our mind, amidst the worsening problems of Metro Manila mostly brought about by what McGee calls "pseudo-urbanization," the disbandment of the metropolis into independent units as proposed by House



Bill 40 is out of the question. It is archaic and anarchic and downright absurd. All over the world, metropolises have adopted or are adopting integrative governmental structures to deal with problems that defy political boundaries or transcend the immediate interests and capabilities of small governments within the metropolis. There are actually three major approaches to metropolitan governance, namely, the one-government, the two-level, and the cooperative approaches. Without going into a detailed discussion of the features of these administrative forms, the two-level approach (which is the most used) appears to be most suited to Metro Manila. Among the most successful two-level approaches are the Comprehensive Urban County Plan of Dade County, Miami, Florida, and the federated structures of Metropolitan Toronto, the Greater London Council and Metropolitan Tokyo. The provisions of Senate Bill 34 share many features of Dade County and Metropolitan Toronto's structure of governance. We can start with this two-tier council-manager structure as envisioned by the bill. It improves on Imelda Marcos' PD 824 and its 5-member Commission in terms of providing democratic representation and citizen participation through the Metropolitan Manila Authority's 17-mayor-member Board of Directors. Perhaps the suggestion of House Bill 1996 of including representatives from each of the 22 congressional districts should be examined more closely to allow proportionate representation among the varying local units. Its provision, too, of fusing the posts of general manager and chief executive which are separate in Senate Bill 34 is a sound one. But the strengths of Senate Bill 34 in terms of mandatory review of local ordinances and resolutions, the power to tax, and mandatory remittance of a portion of local revenues should be retained and stressed. The experience of other metropolitan governments and of the MMC under Imelda Marcos was that effectivity and success come only with vesting such governments with more powers. In this regard, perhaps the suggestion by 53 percent of Metro Manilans in a recent survey that the Chairman should be elected by the whole metropolis should be considered. Not beholden to the Board of Directors, not representing a particular political unit, nor subject in his tenure to the pleasure of the President, the elected Chairman will truly have more power and be more decisive.

#### **The Need for an Intensive Information and Education Campaign**

But amidst selfish and reactionary forces wanting to kill the metropolitanization proposal, we have to alert readers to the possibility of a retrogressive return to the old chaotic set-up of individual governance if a plebiscite is called (as provided for in the Constitution) and local constituents vote against the creation of a special metropolitan political

subdivision. This plebiscite will be called 45 days after a compromise bill is hammered out by both houses of Congress. We agree that consultation is democratic and the devolution of power to local governments (as provided for in a soon-to-be-approved Local Government Code) is good for socioeconomic development. But in a scale of effectivity aimed at achieving a high quality of urban life, there is no question that area-wide integration is superior. At this juncture, the government would be well-advised to conduct a spirited information and education campaign among metropolitan residents if it wants to avoid a destabilizing cultural-environmental backlash resulting from a city untethered and gone wild.

**Meliton B. Juanico**

## ARTICLES

### ENVIRONMENTAL MONITORING: APPLICATIONS TO REGIONAL PHYSICAL FRAMEWORK PLANNING

Candido A. Cabrido, Jr.\*

**ABSTRACT.** *There is a need to incorporate an environmental monitoring component in the physical framework plans of Philippine regions, considering the fast rate of environmental degradation in the country. Environmental monitoring will determine whether the level of resource exploitation and degradation is already exceeding acceptable limits or whether a course of action is meeting its targets. The resulting information generated by the monitoring system will provide a basis in revising and refining the physical framework plan. An approach for monitoring the environmental parameters of the regional physical framework plan is being proposed. The approach involves three actors, namely, the environmental agencies, NEDA Regional Office, and NEDA Regional Coordination and Development Staff. The environmental parameters they are going to monitor include changes in land use quality, water quality, air quality, demographic aspects, and natural resource stock and productivity.*

#### ENVIRONMENTAL MONITORING DEFINED

Environmental monitoring may be described as the systematic observation of environmental parameters in order to determine their desirable or adverse effects on the ecology and economy of a given area. Specifically, environmental monitoring involves the periodic gathering and reporting of environmental data which characterize the state of an environmental variable and comparing this against standard values for the purpose of analysis and the taking of actions or measures necessary for the achievement of goals and objectives.

Environmental monitoring classically connotes actual field monitoring of physical, biological and chemical parameters in order to detect the level of pollution from point sources, as in most cases, and non-point sources, as in few cases. Thus, environmental monitoring usually involves precise and accurate measurements of environmental variables employing highly sophisticated instrumentation and complicated analytical techniques. The art and science of environmental monitoring is still in its

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infancy in the country. Presently, our regional environmental monitoring offices under the Department of Environment and Natural Resources (DENR) lack the equipment and facilities and the technical capability to monitor closely air and water quality. Except for Metro Manila, water and air quality in most of the regions in the country has anyway still not reached an alarming stage. Environmental concerns in the regions are still focused on the rapid degradation of natural resources, particularly soil, forestry and fishery resources. Monitoring environmental resources is not as tedious, complicated and materially demanding as monitoring air or water quality. More quantitative data and information are presently available for the purpose of monitoring environmental resources at the local and regional levels.

### OBJECTIVES OF ENVIRONMENTAL MONITORING AT THE REGIONAL LEVEL

The purpose of incorporating an environmental monitoring component in the Regional Physical Framework Plan (RFPF) is to determine whether the sources of pollution and/or level of natural resource exploitation and degradation are already going beyond the acceptable limits. On the positive side, regional environmental monitoring will indicate whether a course of action is meeting its expectations or targets as planned.

### APPLICATIONS OF ENVIRONMENTAL MONITORING TO REGIONAL PHYSICAL FRAMEWORK PLANNING

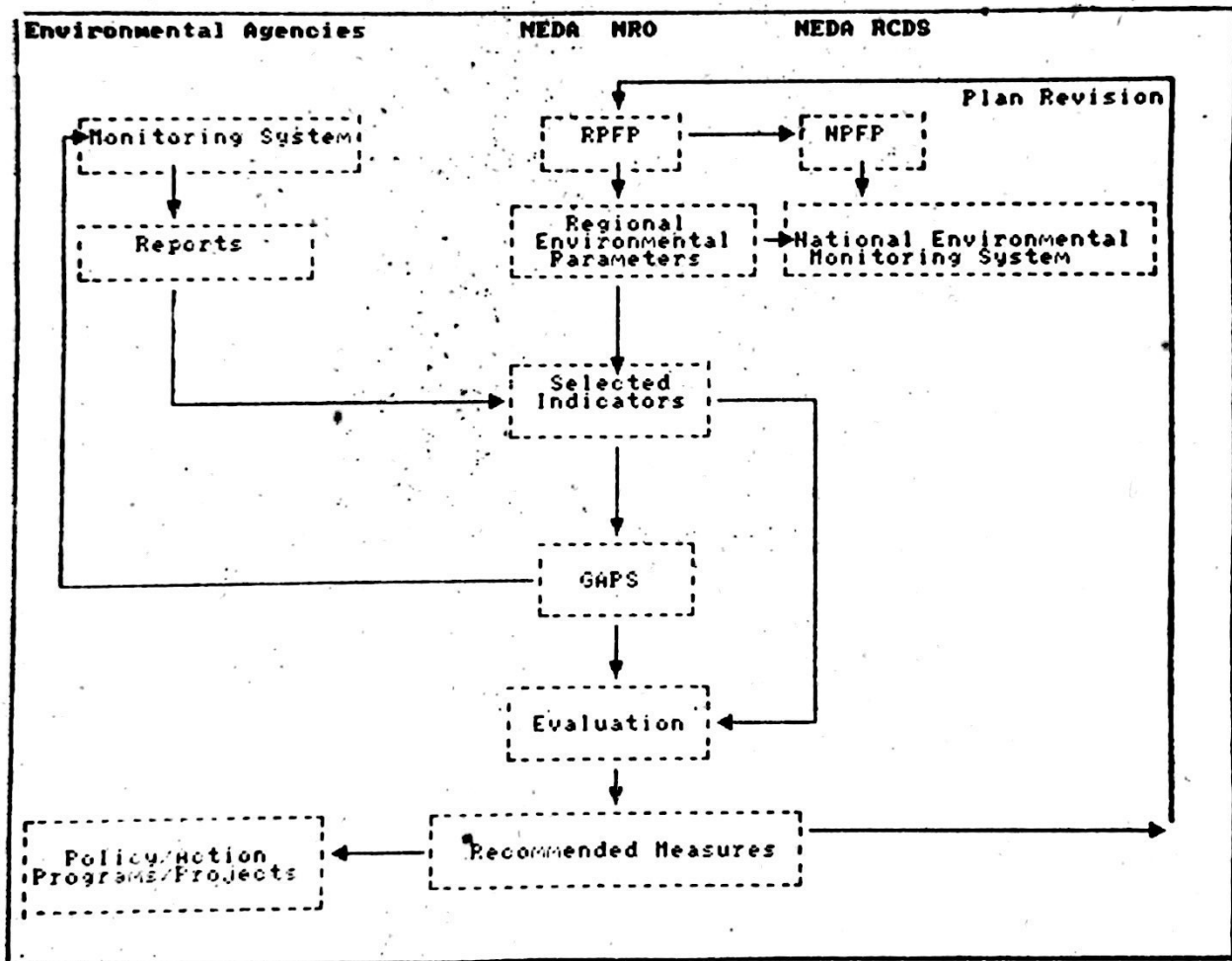
Environmental monitoring provides information which serves to chart the pattern of biophysical changes in an area. The results of environmental monitoring are used to predict and anticipate impending threats and problems as well as evaluate the appropriateness of an action or plan. Thus, the information generated by the monitoring system will serve as a basis in refining and revising the physical framework plan.

The area specificity of environmental monitoring, however, renders its applications to monitoring RFPF environmental parameters somewhat limited. Data at the level of regional aggregation may not be able to capture or may find point sources monitoring not too relevant or useful. Hence, the results generated from monitoring location-specific (i.e., village and/or municipal level) air, water and land quality will be too small to be reflected at the regional level of data aggregation. Nevertheless, RFPF environmental concerns such as land use changes, natural resources stock and productivity, air quality of major cities, water quality of major surface waters, and population distribution by ecosystem type can be monitored at the regional level *directly* through the use of surveys, aerial photographs, and Landsat/Spot imageries, and *indirectly* through the aggregation of data and the use of analytical techniques such as para-

metric assessment, mathematical modeling and simple matching techniques. Indirect methods are usually employed in cases where primary data are not available.

**PROPOSED APPROACH FOR RFPF ENVIRONMENTAL MONITORING**

Fig. 1 graphically illustrates a practical approach for monitoring the environmental parameters of the RFPF. There are three main actors in the system: environmental agencies, National Economic and Development Authority (NEDA) Regional Office (NRO), and NEDA Regional Coordination and Development Staff (RCDS). Environmental agencies have already established their own system of monitoring environmental parameters and they generate reports which the NEDA-NRO could compile to serve as inputs in evaluating the RFPF performance. An inventory and compilation of useful environmental data will enable the



**Fig. 1. ENVIRONMENTAL MONITORING SYSTEM FOR THE REGIONAL PHYSICAL FRAMEWORK PLAN**

NEDA NRO-RPFP planners to validate and make operational their selected environmental parameters. Moreover, specific environmental indicators could be instituted to characterize a given environmental parameter. On the basis of the data available from environmental agencies, the NEDA-NRO will be able to identify the gaps that need to be satisfied. The NEDA-NRO through the RCDS could formally recommend to the concerned environmental agencies the inclusion of RPFP environmental indicators which are presently not covered in their monitoring system.

Once the RPFP environmental monitoring system is put in place, it will be relatively easy to evaluate the performance of the plan against targets. Corrective measures can therefore be recommended to the responsible line agencies once undesirable effects of the sectoral development plan are determined or actions taken by development agencies do not conform with the RPFP plan as manifested by the adverse effects of these development actions on the environment. The RPFP can be revised on the basis of the experience gained by the NEDA-NRO. Apparently, the periodicity of RPFP revision will depend on the frequency of monitoring. The RCDS should play a key role in assisting the NROs in the formulation of recommendations (policy, action programs and projects) for the adoption and implementation of concerned line agencies. Likewise, the RCDS should translate the RPFP environmental monitoring system into a National Physical Framework Plan (NPFPP) environmental monitoring system.

#### Environmental Parameters

The most critical environmental parameters in the RPFP plan include the following:

- changes in land use
- changes in land quality
- changes in water quality
- changes in air quality
- changes in population distribution, quantity and quality
- changes in the stock and productivity of natural resources

#### Indicators for Monitoring

Indicators are specific and objectively verifiable measures of changes or results brought about by an activity. They provide standards from which to measure the achievements of a plan against established targets or goals. Indicators commonly used in monitoring changes in the environmental parameters of RPFP are as follows:

| Category                | Possible Sources of Data | Relevance to RPFP           |
|-------------------------|--------------------------|-----------------------------|
| <i>Land use changes</i> |                          | <i>Highly relevant (HR)</i> |

|  |                      |    |
|--|----------------------|----|
| — rate of land use conversion                        | DAR, <sup>1</sup> DA | HR |
| — encroachment index (urban land uses)               | HLURB, DAR           | HR |
| — habitat index (natural parks and wildlife areas)   | DENR                 | HR |
| <i>Changes in land quality</i>                       |                      | HR |
| — extent and magnitude of soil erosion               | BSWM                 | HR |
| — soil fertility level                               | BSWM                 | HR |
| — grassland/shrubland expansion (esp. cogonal areas) | FMB                  | HR |
| — extent and magnitude of soil pollution             | BSWM                 | HR |
| — extent and magnitude of irrigation development     | NIA                  | HR |
| — crop yield/production                              | BSWM                 | HR |

(Note: The degree of relevance relates to the significance of the information at the regional level of data aggregation. Although all of these indicators are important, not all of them can be captured at the regional level of data aggregation. Thus, the relevance grading is adopted.)

|                                 |          |                           |
|---------------------------------|----------|---------------------------|
| <i>Changes in water quality</i> |          | <i>Less relevant (LR)</i> |
| — level of dissolved oxygen     | EMB      | LR                        |
| — presence of fecal coliform    | EMB, DOH | LR                        |
| — pH level                      | EMB      | LR                        |
| — biological oxygen demand      | EMB      | LR                        |
| — nitrate level                 | EMB      | LR                        |
| — phosphate level               | EMB      | LR                        |
| — temperature                   | EMB      | LR                        |
| — turbidity                     | EMB      | LR                        |
| — total solids                  | EMB      | LR                        |
| — presence of toxic elements    | EMB      | LR                        |

<sup>1</sup> DAR — Department of Agrarian Reform; DA — Department of Agriculture; HLURB — Housing and Land Use Regulatory Board; DENR — Department of Environment and Natural Resources; BSWM — Bureau of Soils and Water Management; FMB — Forest Management Bureau; NIA — National Irrigation Administration; EMB — Environmental Management Bureau; DOH — Department of Health; NEDA — National Economic and Development Authority; FNRI — Food and Nutrition Research Institute; NSO — National Statistics Office; PAGASA — Philippine Atmospheric, Geophysical and Astronomical Services Administration; PHIVOLCS — Philippine Institute of Volcanology and Seismology; LWUA — Local Water Utilities Administration; PCARRD — Philippine Council for Agriculture, Forestry and Natural Resources Research and Development; BFAR — Bureau of Fisheries and Aquatic Resources; BAS — Bureau of Agricultural Statistics; UP-MSU — University of the Philippines Marine Science Center.

- |                                  |     |    |
|----------------------------------|-----|----|
| — presence of pesticide residues | EMB | LR |
|----------------------------------|-----|----|

All these water quality indicators are less relevant (i.e., less significant at the regional level of monitoring) to RPPF. Instead, an index of overall water quality would be more relevant for regional environmental monitoring. For this purpose, a composite index could be formulated as

$$WQ_i = \sum_{i=1}^n w_i q_i$$

$WQ_i$  is a number between 0 and 100;  $q_i$  is the quality of the  $i$ th parameter, a number between 0 and 100;  $w_i$  is the unit weight of the  $i$ th parameter, a number between 0 and 100.

*Changes in air quality*

- |                               |     |              |
|-------------------------------|-----|--------------|
| — level of sulfur oxides      | EMB | LR           |
| — level of nitrogen dioxide   | EMB | LR           |
| — level of carbon monoxide    | EMB | LR           |
| — level of particulate matter | EMB | LR           |
| — level of hydrocarbons       | EMB | LR           |
| — noise level                 | EMB | Not relevant |
| — odor pollution              | EMB | Not relevant |

Instead, an index of overall air quality would be more useful for RPPF. For this purpose, a composite index could be formulated as follows:

$$AQ_i = (5.7 \sum_{i=1}^{i=5} (C_i/S_i))^{1.37}$$

The coefficient and exponent are used to scale  $AQ_i$  such that non-polluted background levels give an  $AQ_i$  of 10 and pollutant levels at their limits yield a value of 100. E.g., 10-20 = excellent air quality; 21-40 = good; 41-60 = fair; 81-100 = bad; and  $> 100$  = dangerous.  $C_i$  is the concentration of pollutant  $i$ ; and  $S_i$  is the standard for pollutant  $i$ . Air and water quality standards are given in a publication of the DENR.

*Changes in population distribution, quality and quantity*

- |   |           |    |
|---|-----------|----|
| — population density per ecosystem type | NA        | HR |
| — population carrying capacity          | NEDA      | HR |
| — education and nutrition levels        | FNRI, NSO | HR |
| — population size and growth rate       | NSO       |    |
| — migration flow                        | NSO       |    |
| — employment and income                 | NSO       |    |



*Changes in stock and productivity of natural resources*

Soil and water resources (see land quality)

|  |                  |    |
|--|------------------|----|
| — moisture availability  | BSWM, PAGASA     | HR |
| — recurrence of natural calamities (typhoons, drought, earthquakes and flooding) | PHIVOLCS, PAGASA | HR |
| — extent and magnitude of salt-water intrusion                                   | LWUA, PCARRD     | HR |

*Forest resources*

|  |           |    |
|--|-----------|----|
| — rate of deforestation                      |           |    |
| vs.  |           |    |
| rate of reforestation                        | FMB       | HR |
| — rate of afforestation                      | FMB       | HR |
| — extent and magnitude of upland cultivation | FMB, BSWM | HR |
| — forest cover (old growth dipterocarps)     | FMB       | HR |
| — yield of timber and fuelwood               | FMB       | HR |

*Fishery resources*

|  |                    |    |
|--|--------------------|----|
| — rate of conversion of mangrove swamps into fishponds | FMB, BFAR          | HR |
| — catch per unit effort                                | BFAR, BAS          | HR |
| — stock assessment                                     | BFAR               | HR |
| — rate of sedimentation                                | NA                 | LR |
| — live coral cover                                     | DENR, UP-MSC, BFAR | HR |
| — coral diversity                                      | DENR, UP-MSC, BFAR | HR |
| — mangrove cover                                       | DENR               | HR |
| — fishery yield/production                             |                    | HR |

**Constraints and Limitations**

Data for some of the indicators are presently not available (NA). Paucity in data can be remedied by generating information from field surveys, aerial photographs and Landsat/Spot imageries through the technical assistance of concerned agencies. It is, however, important to note that air and water quality data are mostly available only for major cities like Metro Manila, Cebu and Davao and such data are not available for the other major towns and cities in the country. Most major rivers and lakes in the country (except for Pasig River and Laguna Lake) either have no updated data or no data at all.

**Monitoring of Land Use Shift**

Monitoring of land use shift involves land use accounting. This is

particularly important in monitoring changes in land use configuration.

#### *Land Use Shift Matrix*

The first step in the analysis of land use shift is to categorize the different land uses. For the RPPF, the land use categories are as follows:

##### Production Land Use

- croplands
- fishing grounds
- timber and fuelwood forests
- mineral lands
- rangelands
- tourism areas

##### Protection Land Use

- critical watersheds
- calamity-prone areas
- old growth forests
- natural parks and wildlife habitat
- reservation areas
- wetlands
- alluvial plains

##### Settlement Land Use

- residential
- commercial
- industrial
- institutional

##### Infrastructure Land Use

- transportation
- communication
- power and energy
- irrigation
- waste disposal

The next step is to provide a clear definition of each category in order to minimize overlaps. Overlaps will result into double counting and lead to inaccurate land use shift accounting. For areas with multiple uses, they can be categorized according to their most dominant land use. If this is found to be inappropriate they can be subclassified or be given a distinctly separate category (i.e., mixed land uses) for accuracy.

The third step is to compile statistics (every 3 or 5 years) on all the categories.

The fourth step is to fill-up the matrix with the statistical data gathered.

The fifth step is to compute for the losses, gains and new value of each land use category using the following formula:

Each element shown in the matrix is  $A_{ij}$ ;  $A$  = hectares;  $i$  = row number;  $j$  = column number. A dummy variable  $k$  will be used as the category index when referring to hectares gained or lost or to total hectares. The totals and changes may be computed as follows:

$A_{jk} = \sum_i A_{ijk}$  hectares gained by production land use from other sources during the period covered. The diagonal value  $i=j$  is omitted.

$A_{ik} = \sum_j A_{ijk}$  hectares lost by production land use to other uses during the period covered. The diagonal value  $i=j$  is omitted.

$A_k(1990) = A_{ij}$  hectares of production land use at the end of 1990.

$A_k(1995) = A_k(1990) + A_{jk} - A_{ik}$

The net change is

$A_{nk} = A_{jk} - A_{ik}$

$A_k(1995) = A_k(1990) + / - A_{nk}$

A hypothetical example using the land use shift matrix is shown in Fig. 2.

FIG. 2. LAND-USE SHIFT MATRIX

| Land Use       | Production | Protection | Settlement | Infra | RT | NC  | NV |
|----------------|------------|------------|------------|-------|----|-----|----|
| Production     | 100        | 0          | 20         | 10    | 30 | -10 | 90 |
| Protection     | 20         | 100        | 10         | 5     | 35 | -35 | 65 |
| Settlement     | 0          | 0          | 10         | 5     | 5  | -25 | 35 |
| Infrastructure | 0          | 0          | 0          | 5     | 0  | -20 | 25 |
| CT             | 20         | 0          | 30         | 20    |    |     |    |

Notes: Column =  $j=4$ ; Row =  $i=4$ ; RT = row total or losses; NC = net change; CT = column totals or gains; NV = new value.

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## DISTRIBUTION OF THE MAIN DOMESTIC FUEL ITEM IN GHANA: RAMIFICATIONS AND DEDUCTIONS

S.T. Addo\*

**ABSTRACT.** Woodfuel is the main source of domestic energy in Ghana and charcoal is the predominant domestic fuel for most urban households. But charcoal is the most expensive domestic fuel in Ghana and takes a high percentage of the daily wage. The preference for charcoal derives from the fact that it can be bought in small quantities. About 80 percent of the charcoal supply comes from the savanna zone to the north of the country, but, paradoxically, the main consumption centers are located in the south of the country. A combination of transport modes are used in the distribution of this local fuel but, in all cases, trucks are the dominant mode. Transport charges are observed to be positively related to distance, with about 20 percent of haulage expenses going to fuel purchase. Inefficiencies characterize the distribution of charcoal by specialized transporters and this is mainly due to poor road quality and the long wait for a load between trips. A cargo transporters' cooperative is proposed to reduce these inefficiencies. A more lasting solution to transportation problems would be the setting up of woodlots at urban center peripheries that will serve as proximate sources of charcoal material.

### INTRODUCTION

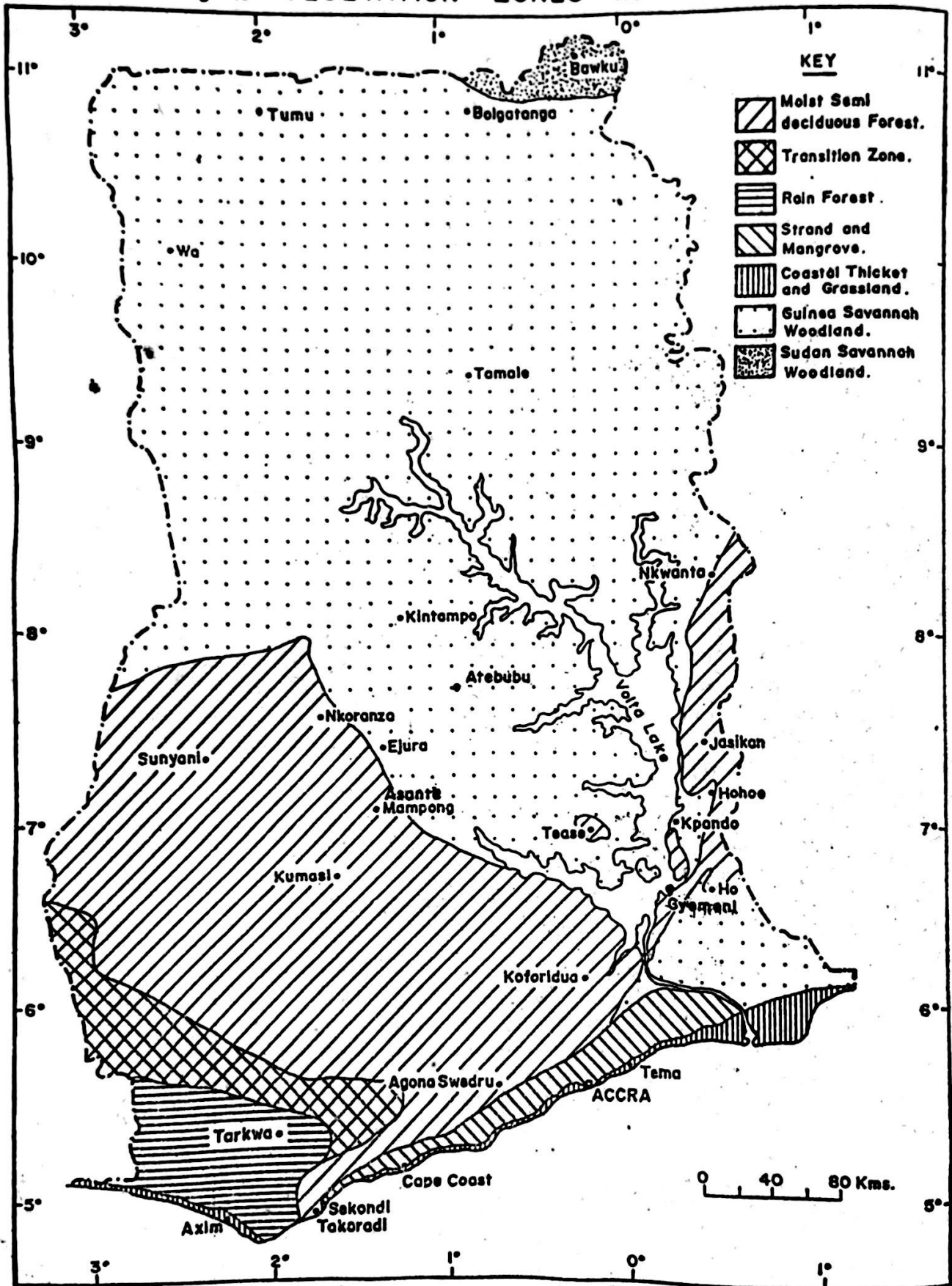
In Ghana where over 60 percent of the population is engaged in agriculture with the slash-and-burn technique as the dominant agricultural practice, the main domestic fuel has for many years been derived as a by-product of the agricultural system. This situation has remained the same for a greater part of rural Ghana. Rapid urbanization after the Second World War and the tremendous socio-political transformation that took place after independence in March, 1957 created a powerful urban segment of the population whose demands for domestic fuel are not only varied but different from that of rural dwellers. Woodfuel is still used by some members of the urban population but architectural designs, shortage of normal kitchen facilities, and economic constraints have resulted in the use of charcoal as the main domestic fuel by over 70 percent of the urban population in Ghana (Nketiah, *et al.*, 1988).

Out of the 10 largest urban centers in Ghana in 1984,<sup>1</sup> only Tamale — the third largest urban center (135,952) — is located in the northern half of the country (Nabila, 1988). This underscores the fact that the southern sector of the country is more urbanized than the north. Against this urban distribution pattern is a situation where close to 80 percent

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<sup>1</sup> The 10 largest urban centers in Ghana in 1984 were Accra, Kumasi, Tamale, Tema, Sekondi-Takoradi, Obuasi, Koforidua, Cape Coast, Ashiaman and Ho (Fig. 1).

Fig. 1. VEGETATION ZONES IN GHANA



of charcoal supplies comes from the north where the most preferred species for charcoal production (*Anogeissus leiocarpus* and *Terminalia avicenioides*) abound in the Guinea savanna woodland, the major vegetation type in the zone (Addo, 1990). With the charcoal production points located in the north of the country and the markets mainly in the south, distribution of the product becomes a major issue.

In this paper I intend to discuss the mechanisms of charcoal transportation in Ghana and highlight its weaknesses as well as offer suggestions for improvement in the face of changing ecological conditions and government efforts at deemphasizing the use of charcoal.

### MECHANISMS OF CHARCOAL TRANSPORTATION

Even though much of the charcoal used in Ghana is produced in the north of the country, nearly 20 percent of the total is obtained from the south. The movement of charcoal from charcoaling sites to the nearest motorable roads is a phenomenon prevalent in the south where production points are between 1 and 6 km away in the forest. Producers therefore hire labor to headload bags of charcoal to the nearest point along a motorable road. Hiring charges are usually a function of size and weight of load as well as the distance actually covered on foot. At 1988 prices these charges ranged between ₵100 and ₵200<sup>2</sup> for carrying a 50 kg maxi bag of charcoal for distances ranging between 1 and 3 km and between 3 and 6 km, respectively. Mini bags weighing about 25 kg attracted half the rates levied on maxi bags.

It is normal practice to pass on expenditure incurred in headloading charcoal to motorable road points to the buyer. This is partly responsible for the relatively high cost of charcoal at producing areas in the western and central sections of the southern half of the country (Table 1). The headloading phenomenon is adequately catered for in cell two in Fig. 2 (counting from the top and from left to right).

In the extreme north of the country, i.e., areas around Wa, Tumu and Bolgatanga (Fig. 1) where charcoaling is dominated by women, the producers themselves carry the charcoal in big enamel bowls to the market (often located along a motorable road) for sale to customers.

A peculiar and interesting situation occurs in the area around Tease, southwest of Lake Volta in the Afram Plains (Fig. 1). Here headloading is undertaken to convey bags of charcoal to various ports of embarkation along the lake for onward conveyance by motorized canoe to Gyemeni port which is on the eastern shore of Lake Volta and on the same latitude with Ho (Fig. 1).

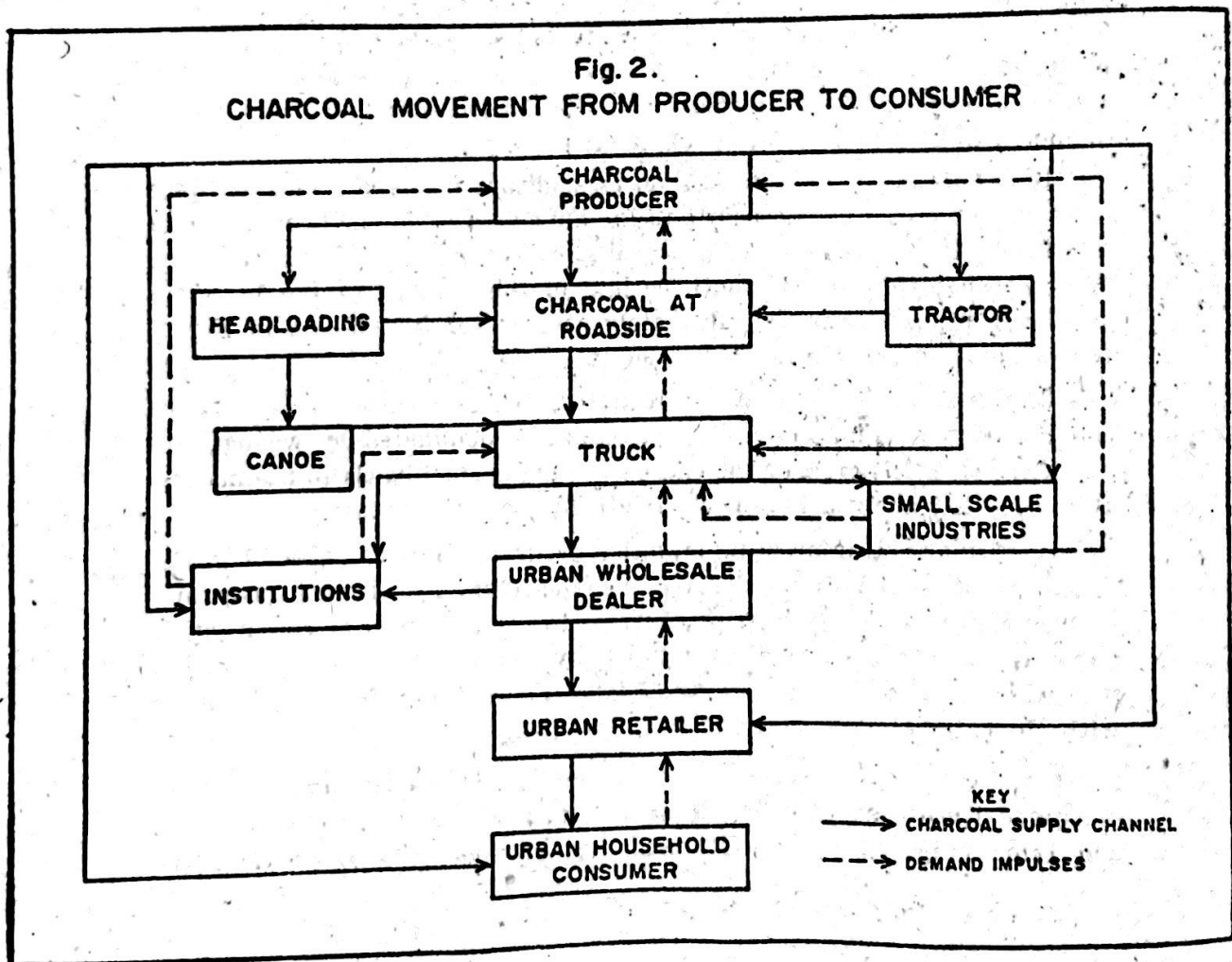
On arrival, the double-decker canoes are off-loaded and the bags of charcoal are then transferred on to trucks which take them to Accra and Tema (Fig. 1). Thus, Gyemeni port on the Volta Lake plays the

<sup>2</sup> At the time of the survey, 1US\$ equalled 227¢(cedis).

**TABLE 1. MOVEMENT OF BAGS OF CHARCOAL BY HEADLOADING, CANOE AND TRACTOR TO ROADSIDE**

| Serial No. | Charcoaling Point | Administrative Region  | Headloading Cost to Roadside (Cedis) | Cost of Movement Roadside by Tractor | Selling Price at Roadside | Movement to Roadside Expressed as % of Selling Price |
|------------|-------------------|------------------------|--------------------------------------|--------------------------------------|---------------------------|--|
| 1          | Abrafo            | Central                | 120                                  | —                                    | 1,200                     | 10   |
| 2          | Nsaba             | Central                | 50                                   | —                                    | 650                       | 8  |
| 3          | Bonsa             | Western                | 120                                  | —                                    | 800                       | 15   |
| 4          | Kwankrom          | Western                | 200                                  | —                                    | 900                       | 22   |
| 5*         | Beyond Gyemeni    | Eastern & Volta        | 100                                  | —                                    | 600                       | 33   |
| 6          | Ve-Golokuati      | Volta                  | 100                                  | —                                    | 700                       | 14   |
| 7          | Ejura             | Ashanti                | —                                    | 100                                  | 200                       | 50   |
| 8          | Mami krobo        | Eastern (Afram Plains) | —                                    | 100                                  | 500                       | 20   |
| 9          | Tease             | Eastern (Afram Plains) | —                                    | 200                                  | 500                       | 40   |
| 10         | Nyansoro Zongo    | Brong Ahafo            | —                                    | 80                                   | 300                       | 27   |

\* Movement cost by canoe.





role of a transit port. This phenomenon is again adequately catered for in cells 5 and 6 in Fig. 2. It must be noted that charcoal is transported by canoe to Gyemeni once a week on Thursdays which is Gyemeni market day.

The greatest charcoal-producing region in Ghana is the area enclosed by Asante Mampong, Atebubu, Kintampo and Nkoranza (Fig. 1). Charcoal production in this rectangle is dominated by the Sisaala ethnic group who hail from Tumu, Lambussie, Finsi and their surrounding villages in the northwest (Fig. 1). The Sisaala detest headloading and they avoid it by building motorable roads between the nearest good (all weather) roads and their charcoal-producing sites which are used by trucks mostly in the dry season (November-April) (see cell 6 in Fig. 2). In the wet season (May-October) when the ground becomes too soft and slippery for trucks, their place is occasionally taken by tractors. Fortunately, there is a high concentration of tractors in the area engaged in both transportation and plowing of farmlands. Thus, even though charcoaling has negative effects on the ecology of the producing areas, the Sisaala have helped to open up farmlands and have thus made them accessible, at least, to the tractor. Headloading of farm produce has therefore declined considerably in this part of the country. For example, there are more than 200 tractors in Nkoranza District alone and there is, at least, one tractor in every village.

Each of the key towns constituting the charcoal rectangle is surrounded by numerous charcoal-producing villages within a radius of between 10 and 50 km. These villages are linked to the key towns by third or fourth class roads which are hardly passable after heavy downpours due to frequent outcrops of clay formations along various stretches of these roads. It is the traversing of these roads which is the most expensive activity in the charcoal haulage industry.

Trucks in the 10-ton category usually carry between 200 and 250 bags of charcoal which is twice their legal carrying capacity. However, to avoid getting stuck on the slippery earth roads, they break the load into two and cover the earth road distance twice. This is confirmed by the fact that a maxi bag of charcoal in the Kintampo area, for example, attracts a transportation fee of ₵300 to Kumasi and just an additional ₵100 to Accra even though the distance between Kumasi and Accra is 30 percent over and above the distance between Kintampo and Kumasi. Field investigations revealed that traversing the slippery clayey third or fourth class roads twice attracted 50 percent of the fare from Kintampo to Accra. Thus, even though distance is a major determinant of transportation cost, quality of road also plays a significant role in the fixing of transportation rates.

### Transportation Charges

In the developed Western world the fixing of transportation rates has moved away from the strict per/mile or per/kilometer concept to the use of tapering fares and grouping (Taaffe and Gauthier, Jr., 1973). These two modifications have the advantage of reducing the transport cost of freight from distant locations.

Since transportation rates in Ghana are generally based on the per/mile concept, thus making distance a major determinant of transportation charges, a correlation between distance and transportation charges involving 14 items was carried out (Table 2). This analysis yielded an  $r$  value of 0.85078 and an  $r^2$  value of 0.72383, significant at the 99.99-percent confidence level. In other words, 72 percent of the variation in transportation charges is a function of distance. The remaining 28 percent of the variation in transportation charges could, most probably, be accounted for by road quality and any other hidden factors.

Transportation charges generally constitute more than 50 percent of the wholesale price of charcoal in Kumasi and Accra during the wet season. This figure rises to 50 percent during the dry season when charcoal prices are lowest. Thus, between 30 and 50 percent of charcoal wholesale prices in Kumasi and Accra are attributable to truck haulage charges. The variation in the percent values is due to the fact that transportation charges (by truck) remain constant irrespective of the season while charcoal prices are higher during the wet season because of difficulties encountered in production, resulting in limited supplies. On the other hand, supplies increase during the dry season and prices

TABLE 2. RELATIONSHIP BETWEEN DISTANCE AND TRANSPORT COST

| Origin         | Destination | Round Trip Distance Linking Origin with Destination (Km) | Transport Charges per Maxi Bag (50 Kg) | Cost Price at Origin Dry Season (Cedis) | Transport Cost Expressed as % of Original Cost |
|----------------|-------------|--|--|---|--|
| Abrafo         | Cape Coast  | 56   | 100                                    | 1,200                                   | 8.3  |
| Nsaba          | Accra       | 178  | 150                                    | 650                                     | 23.1   |
| Bonsa          | Tarkwa      | 32   | 100                                    | 800                                     | 12.5   |
| Bonsa          | Takoradi    | 148  | 100                                    | 800                                     | 12.5   |
| Kwankrom       | Takoradi    | 100  | 200                                    | 900                                     | 22.2   |
| Kintampo       | Accra       | 1,050  | 400                                    | 200                                     | 200.0  |
| Kintampo       | Kumasi      | 610  | 300                                    | 200                                     | 150.0  |
| Nkoranza       | Kumasi      | 408  | 300                                    | 300                                     | 100.0  |
| Gyemeni        | Accra       | 292  | 130                                    | 600                                     | 21.7   |
| Ve-Golokuati   | Accra       | 400  | 200                                    | 700                                     | 28.6   |
| Odumasua       | Accra       | 480  | 300                                    | 500                                     | 60.0   |
| Drabonso       | Kumasi      | 180  | 200                                    | 500                                     | 40.0   |
| Nyansoro Zongo | Kumasi      | 262  | 300                                    | 300                                     | 100.0  |
| Nakong         | Navrongo    | 70   | 100                                    | 500                                     | 20.0   |

adjust downwards. The drivers are able to charge the same transportation fares irrespective of the season and motoring difficulties because they operate almost like a cartel. This is partly the reason why they are able to make a net income of 12 percent of the final retail price to the consumer for each 50-kg bag of charcoal they transport from Kintampo to Accra.

### **DEDUCTIONS AND RECOMMENDATIONS**

It has been highlighted in this paper that charcoal transportation in Ghana is not limited to the use of only one mode of transport. Three different modes, namely, headloading, the use of tractors and trucks, and the use of canoes were identified. Of the three, the truck/tractors play a major role. In spite of the old age of the trucks, drivers indulge in carrying excess load, probably to make up for time wasted at charcoal-producing points to secure what they consider to be a full load for each trip.

Most of the specialized charcoal transporters are to be found in the Asante Mampong-Atebubu-Kintampo-Nkoranza rectangle. They operate like a cartel and they have succeeded in maintaining uniform transport charges throughout the year even though movement is easier and less expensive on the dirt stretches of the roads during the dry season. Transportation charges are positively related to distance. About 20 percent of haulage expenses goes into the purchase of fuel. Thus, using just cost and not quality of energy generated by petroleum and charcoal, respectively, it could be stated that it makes economic sense to burn the present amount of petroleum products used in conveying bags of charcoal to the consumer.

Charcoal transportation is, however, fraught with several inefficient and non-economic practices. These include the waiting time of 2 weeks (during which the truck is idle) before a truck is loaded, and making of the north-bound trips without cargo. Even though the specialized charcoal transporters operate like a cartel, trucks are individually owned and this is partly responsible for the operational and management lapses.

The transformation of the specialized charcoal transporters' association into a transporters' cooperative under a central management body with offices in the main centers in both production and consumption zones will create user confidence and encourage both individuals and companies to hire their services for the transportation of other forms of dry cargo, particularly north-bound cargo. This will help cut down the actual operational cost of the vehicles, reduce transportation charges of charcoal, and may eventually convince them that it is more profitable to adhere to their licensed weights on their south-bound journeys. With such a cooperative in place, communication between charcoalers, dealers

and transporters will improve and hopefully prevent the situation where trucks spend days waiting for a load while other places may be urgently in need of transport.

The establishment of woodlots with the most suitable species at the outskirts of urban centers, especially those south of the country, will not only bring ecological improvement but serve as supply sources of wood for charcoalers. In this way, the transportation cost in charcoal distribution will be reduced to the barest minimum. A short-term alternative solution will be encouraging a high proportion of the urban population to switch over to the use of liquified gas, provided credit facilities will be available to help individuals procure gas cookers and cylinders and provided liquified gas will always be available at the main sale outlets.

These are issues worth pondering over since the northern part of Ghana and West Africa is currently being seriously threatened by desertification in addition to the alarming depletion of the preferred species for charcoal production. Moreover, there is an underutilization of liquified gas produced by the country's only petroleum refinery at Tema.

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## A NEW APPROACH TO DEVELOPMENT: THE CASE OF BULACAN

Berhane Belay\*

**ABSTRACT.** *Non-government organizations, or NGOs, have been known traditionally to concern themselves with voluntary, multiple-role activities that serve the needs and general interest of the public. Lately, there has been a shift in NGO activities from the purely operational to the more catalytic or developmental type. In turn, a new dimension within NGO developmental activities, particularly within developmental cooperation, is that of participation in efforts to develop the capabilities of local governments. The Local Government Capability Building Project which is piloted in the Philippines' Bulacan Province constitutes this new approach to development cooperation by an NGO within the context of increasing decentralization and local autonomy. The project has three phases: training, action or implementation, and evaluation. In the conferences, training sessions and workshops conducted among local officials and employees, the Goal-Oriented Project Planning (GOPP) strategy offers much promise for mobilizing local initiative and encouraging citizen participation.*

### NGOs IN PERSPECTIVE

Non-government Organizations (NGOs) or Private Voluntary Organizations (PVOs) and Public Interest Organizations (PIOs), as they are sometimes referred to, are generally defined as those entities which are not part of a government and which have not been established as a result of an agreement between governments (e.g., research institutes, trade unions, professional associations, youth organizations, Chambers of Commerce, religious institutions and private foundations). Formed at the initiative of the private sector, these organizations primarily concern themselves with voluntary activities that serve the needs and general interest of the public.

These organizations were claimed to have performed certain multiple roles, namely: as mobilizers of local human or material resources; as vehicles for grassroot participation and mobilization; as delivery system units for social welfare services, health services, infrastructure facilities and agricultural inputs; and as conduits of funds. Recent trends, however, have indicated a change in the nature of activities which they have been undertaking. This change is notably indicated by the shift from those activities that are exclusively operational to those that are more catalytic or developmental in nature.

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With the increased emphasis on self-reliance in developing economies, NGOs have acquired a new status, impetus and role. The conduct of catalytic foundation-like activities was designed to achieve sustainable systems of development. This was done with the realization that self-reliant development initiatives are likely to be sustained only to the extent that local public and private organizations are linked to a supportive national development system, and to the extent that the NGOs are involved more with various public and private organizations (e.g., local and national governments, private enterprises, other development sector institutions) that control resources and policies on local development.

In addition, with the growing concern for development, NGOs have indulged in different forms of cooperation in Third World countries in order to meaningfully contribute to the development process. One of the new dimensions in NGO activities with respect to development cooperation is their participation in efforts to develop the capabilities of local governments. Bulacan Province in the Central Luzon Region of the Philippines, considered as a pilot site, provides a case where this participation is seen as a means to promote local autonomy and to effect the decentralized approach to development that all give importance to people's participation in their own development and to the building up of self-reliance.

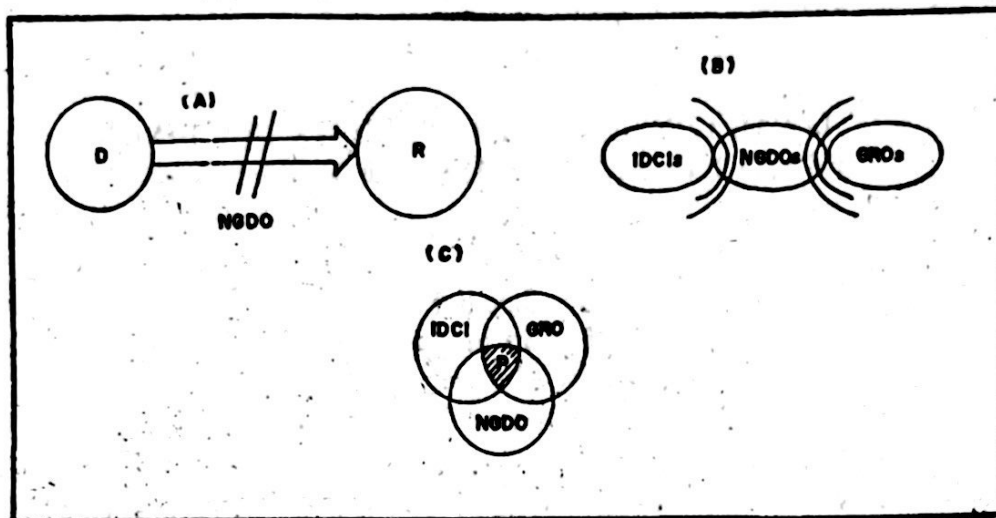
Development cooperation has been characterized by three main forms of relationships contained in three models of cooperation (Padron, 1987:73). The main sectors under the first type of cooperation have been identified as the three major NGOs claimed to be active in the development process in Third World countries, namely: (1) non-governmental development organizations (NGDOs), i.e., local or national (which exist by establishing working relationships with a popular sector, usually the beneficiary of its activities), which cater to the various needs of (2) grassroots sectors and their organizations (GROs), with the support of (3) international development cooperation institutions (IDCIs). The NGDO serves as the vehicle for channelling IDCI aid to the poor (Fig. 1).

Within the second type of relationship, IDCIs view the NGDOs as an intermediary between them and the GROs, while in the third type of relationships, the NGDOs stand as one of the three partners in the process of development cooperation, which involves longer-term commitments, with responsibility being shared among the three partners.

The Local Government Capability Building Project that is being piloted in three municipalities, namely, Malolos, Hagonoy and Calumpit in the province of Bulacan, may be considered as a new approach to development cooperation by an NGO based on the following reasons:

First, smoother collaboration between an NGO and the government is effected.

FIG. 1. THREE TYPES OF RELATIONSHIP BETWEEN NGDOs AND IDCIs (PADRON, 1987:73)



Second, the method of collaboration or cooperation facilitates laying down a foundation of democratic structure that is based on the articulation of the people's needs. This articulation takes the form of problem identification and development of activities or projects for implementation to solve the identified community problems in the light of availability and rational resource allocation as implied in the Goal-Oriented Project Planning methodology (ZOPP in German).

Third, the approach is people-oriented or people-centered by nature, assisting and allowing members of a local community to have a voice in making decisions that affect their lives.

Fourth, no parasitic relationship develops from the relationship as both government and the NGO are co-financiers, i.e., both contribute a certain percentage of the funding for the project.

Fifth, the NGO serves as a catalyst for local development efforts and fosters the enhancement of the capabilities of the entire local government bureaucracy through team building, starting from the governor down to the rank-and-file employees.

Sixth, NGOs act as a complementary rather than an alternative mechanism in the delivery of public services particularly in the transfer of skills and technology, aside from the giving of commodity assistance.

Seventh, and most important, NGOs assume a positive role as an effective partner of the central government in the enhanced institutionalization of its own overall local capabilities, which is one of the pre-conditions to effective decentralization.

Moreover, since the then DLG (Department of Local Government)

is the primary agency of the central government that is mandated by law to provide overall leadership and policy directions in the continuing development of local governments, it is hoped that the Department will be able to formulate alternative development strategies/models from such experience in the area of capability building.

### **THE LOCAL GOVERNMENT CAPABILITY BUILDING PROJECT IN THE PROVINCE OF BULACAN**

There is an emerging trend or approach wherein an NGO has become instrumental in effecting the decentralization approach to development. Consistent with this, a non-governmental organization in the country has actively engaged in the effort to improve the overall capabilities of local government units in support of increasing decentralization and local autonomy.

Pursuant to this, a project proposal on local government capability building was submitted to the Konrad Adenauer Foundation (KAF) based in West Germany by the Bureau of Local Government Supervision, Department of Local Government in 1987. It was approved and implemented towards the last quarter of 1989. The project's main objective was to introduce the concept of "team building" as a core strategy for enhancing the administrative, fiscal and technical competencies of local governments in the country. The concept of team building in this project includes the following reinforcing components:

1. Promotion of a unified single thinking and direction between and among the elected officials and the provincial and local governments, on one hand, and the members of the provincial and local bureaucracies, on the other, in developing capabilities in the implementation and execution of regional and local projects;
2. Role definition of the various components of the local bureaucracies in the development effort as well as effective administrative support to the local capability development efforts;
3. Commitment of the provincial leadership in one concerned effort towards development and conscious participation of all levels of the bureaucratic hierarchy from the highest official down to the lowest level of the rank-and-file; and
4. Vertical as well as lateral planning and development of activities and projects by making them interrelatedly reinforcing to one another in the attainment of one singular goal (KAF and LOGO-DEF, 1990:3-4).

In the long run, the project's objective is to formulate development strategies that promote overall capability enhancement at local levels within the context of increasing decentralization and project experiences



deemed useful and significant for replication in other local governments in the country.

The project is intended for implementation in five project sites involving medium-sized local governments in 5 out of 14 regions in the whole country selected on the basis of established criteria. Each pilot site is supposed to undertake the project over a period of 18 months covering the above three phases. The first six months cover the project's training phase, the next six months the action phase or implementation of physical/community projects, and the remaining six months the evaluation phase.

The project had for its first pilot area the province of Bulacan (Fig. 2) where the first phase has been completed and the second phase is half-way through. During the first phase, LOGODEF as the implementing and executing agency for the project in collaboration with BLGS, DLG and LOC, CPA-UP<sup>1</sup> was able to achieve the following:

To ensure comprehensiveness of project coverage and active participation from the grassroots level, an orientation conference as well as training sessions accompanied by ZOPP workshops were conducted for participants who were categorized into four levels, namely:

Level I — provincial governor, vice-governor, provincial board members, department heads of the provincial government;

Level II — middle management group composed of division and section chiefs;

Level III — officials of two pilot municipal governments of the province, i.e., Hagonoy and Calumpit (Fig. 2) comprising mayors, councilors and department heads of the municipal bureaucracy; and

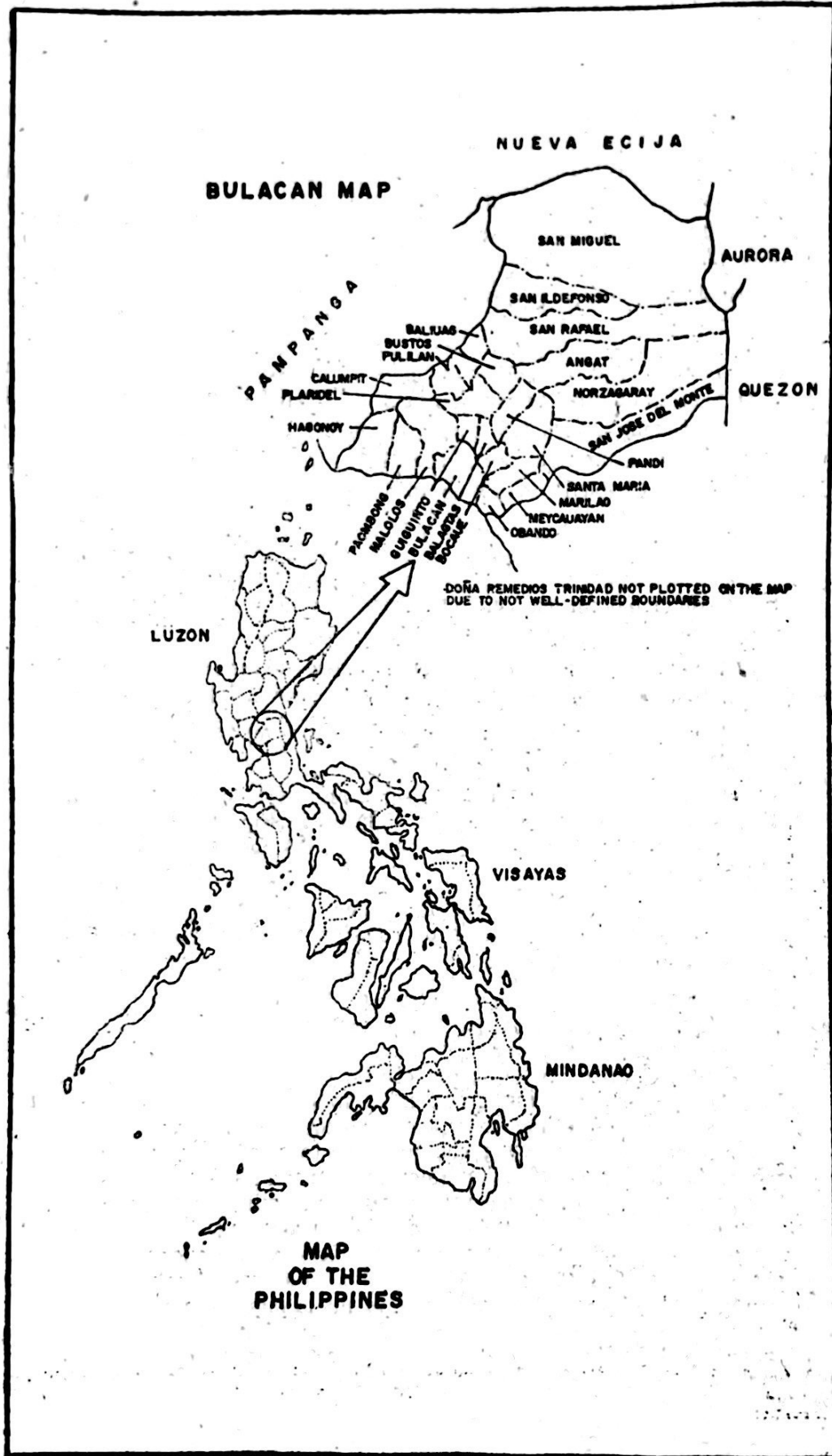
Level IV — rank-and-file employees of the province of Bulacan selected on the basis of position, field of specialization and unit of assignment.

The major course content of the orientation conferences and training sessions in all levels included the following:

...the project concept, objectives, strategies and organizational structure; provincial and municipal development administration (their development plans, socioeconomic profile, and government bureaucracy); commitment to the project's implementation and role definition (signing memoranda of agreement, forming provincial committees, and other administrative project arrangements in the implementation process); development competencies (program planning competencies, managerial competencies, technical competencies, resource mobilization, and accountability); and philosophy and forms of popular participation

<sup>1</sup> Bureau of Local Government Supervision, Department of Local Government; and Local Government Center, College of Public Administration, University of the Philippines.

FIG. 2. LOCATION OF BULACAN PROVINCE AND CONSTITUENT TOWNS



(concept, philosophy and forms, Philippine experience in retrospect, and mobilizing popular participation with its suggested approach and methodology).

With team building as a core strategy and with increased recognition of the need for effective development program priority-setting under conditions of scarce resources and an environment of competing sectoral demands for public services, a German technique or strategy for planning and implementation of development projects known as "ZOPP," or Goal-Oriented Project Planning (GOPP) in English, was introduced in the training sessions and utilized in the workshop. The strategy is principally intended to instill awareness and understanding among the participants of a methodology useful in the process of problem identification ("Problem Tree"), problem solving ("Objective Tree"), and packaging of all the community activities/projects for implementation in solving their problems by considering the amount and source of fund, roles and responsibilities of individuals or organizations, duration, and various indicators for monitoring and evaluation purposes, etc. (project planning matrix).

In order to come up with a framework for capability building to be implemented by LOGODEF as a development intervention and in collaboration with the pilot Bulacan local government Technical Working Committee, a final planning workshop was held, participated in by selected people from the Bulacan local government bureaucracy. Included among the participants were those from the two pilot municipalities (Calumpit and Hagonoy) who tried to integrate and package all the outputs of the four levels mentioned earlier into one "project identification and planning document" of the Bulacan Local Government Capability Building Project.

In the same manner, specification of project objectives, management structure, roles and responsibilities, duration, budget requirement and its source, and provision of project background formed part of each group's activities in the planning workshop. The major projects identified in this final integrating workshop had to do with the following:

1. Improving productivity and increasing the efficiency of provincial government personnel;
2. Ensuring effective and efficient provincial legal service;
3. Effective handling/monitoring of various requests/complaints with the provincial government for infrastructure assistance;
4. Intensification of the collection of taxes, fees and other revenues;
5. Effective and efficient security service;
6. Strengthening and expansion of PPDO Data Bank into provincial data bank;
7. Agricultural programs and strategies from 1990-1991 in the

municipalities of Calumpit and Hagonoy that raise the income of rural families;

8. Increasing revenues from market operations through construction of a new market in the municipality of Calumpit; and
9. Establishment of a multi-purpose training center for the municipality of Hagonoy.

The foregoing projects will be prioritized by the Provincial Council Committee and implemented accordingly, depending on the urgent needs of the community, availability of resources and time, etc.

The second phase, which is the implementation of projects in the three sites (Malolos, the provincial capital, and the municipalities of Hagonoy and Calumpit), has commenced.

As identified in the third among the above nine projects, the Technical Working Group of Bulacan, in collaboration with LOGODEF, reviewed the existing provincial systems, policies, rules and regulations on internal design systems, i.e., touching on communication, record management, and voucher processing using the flow-charting approach to identify weaknesses that hamper performance in the delivery of services. Subsequently, an improved Internal Systems Design covering the three above-mentioned aspects was produced in the same manner and will be installed soon after guidelines are set and the necessary legal processing is made by the Provincial Council Committee. This is an achievement in the area of local administration which has not been comprehensively and continuously addressed in local administrative reforms for development.

The project will involve the initiation and implementation of community projects that are responsive to local needs and problems by the participating local governments themselves using the ZOPP or GOPP methodology. This type of project will mobilize local initiatives and promote citizen participation which is one of the basic ingredients of local capability building.

At present, the issue of local autonomy is a primary concern of the country. The project's experiences and lessons are envisioned to provide a strategy that is more relevant and responsive to the need for administrative reforms as a precondition to effective decentralization and local autonomy.

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## A REGIONAL SURVEY OF LABOR PROBLEMS IN NIGERIAN PEASANT AGRICULTURE

Maurice A. Okoji\*

**ABSTRACT.** *Certain authors hold the view that peasant farming in Africa is endowed with unlimited labor supply. Arguing the contrary, this paper assumes that the low supply of labor seriously limits African peasant agricultural production. Its main objective is to analyze the major problems of labor supply in Nigerian peasant farming with particular reference to the eastern states of the country. Accordingly, it identifies and examines the major factors influencing labor intensity as well as discusses labor supply, organization, cost and productivity. The analysis points to the fact that the manual operation of agricultural tasks, the decreasing supply of family labor, and the high cost of hired labor, among other factors, tend to depress labor supply and, invariably, agricultural production. Thus, although 75 percent of the working population of the region is in agriculture, labor supply remains a critical and limiting variable in peasant farming. This seriously calls for policy considerations designed to improve the present labor supply situation.*

### INTRODUCTION

Two divergent opinions are held about labor in peasant or traditional agriculture in Africa. The first is that peasant farming is endowed with unlimited supplies of labor and authors like Lewis (1954), Helleiner (1966), Singh and Day (1975), and Levi and Havinden (1982) are proponents of this school of thought. The second argues that labor is often a seriously limiting factor of peasant production particularly at certain critical times of the year. Morgan (1977:27) strongly stresses this point.

The first notion is misleading and probably stems from the high proportion of labor in traditional agriculture in Africa. Grigg (1975) rates the average at 65 percent of the total labor in 1970 and notes that it is declining more slowly than in the rest of the world. That there is deficiency of labor in peasant agriculture, on the other hand, is indicated by large-scale seasonal rural-rural migrations in a number of West African countries such as Senegal, Gambia, Liberia, Ghana and Nigeria. It is the writer's view that of all the factors of peasant agricultural production, including land, labor appears to be the most expensive and the most restrictive. This paper sets out, therefore, to analyze the problem of labor in Nigerian peasant agriculture with special reference to the eastern states co-terminally known as southeastern Nigeria. In doing this, the paper examines the factors influencing high intensity of

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labor in peasant farming, the supply and organization of labor migration and, lastly, labor cost and productivity.

### FACTORS INFLUENCING HIGH LABOR DEMAND

Of the several factors which influence high labor demand in peasant farming, five of them are discussed here. They are manual operation of all agricultural tasks, the spatial distribution of holdings, cropping sequence, seasonality of agricultural operations and, finally, rituals, ceremonies and social activities.

#### Manual Operation of Agricultural Tasks

Throughout southeastern Nigeria, the employment of tractor- or animal-drawn implements is virtually non-existent in peasant agriculture. Rather, the use of hand tools such as hoes, machets and axes is common. While it is true that animal-drawn equipment, compared with the hand hoe, is capable of tilling three or four times as much land, and tractor-drawn equipment for its part can prepare ten to twenty times as much land as ox-drawn plow (de Wilde, 1967:98), it is doubtful if the expansion of the cultivated area would decrease the bottlenecks in farming operations. For example, a weeding bottleneck can easily develop if tractorized implements are used mainly to till more land instead of releasing labor which can be engaged in weeding.

Tillage itself is an operation in farming which in the present context means the making of mounds or shallow holes with different kinds of hoes for planting. Other operations such as land clearing, packing of charred and unburned materials, planting and weeding are all done by hand and require a lot of labor if the job is to be completed on schedule. Clearing, burning and packing, for instance, must be done before the rains arrive, while planting must start as soon as the rains set in to avoid weed competition with the crops. The planting of cassava is singularly arduous since it involves gathering the stems from a different or various plots, headloading them to the new farm, cutting them into regular sizes of about 26 cm and planting them at regular intervals of about 1.3 m. All this is manually executed and it requires more than 19 man-days to plant a hectare of land.

Perhaps the most demanding of labor in peasant farming is weeding especially in the heavy, clayey soils of Ikom and Obubra, and the flood plains of the Niger and Cross Rivers in Oguta and Abakaliki, respectively. Weeds grow rapidly and luxuriantly once the rains start and are difficult to control despite the fact that the rhythmic cropping facilitates weed control. They also compete strongly with crops for water, nutrients and light. On this account, peasant farmers weed early while the crops are young so that they may not be checked in their early growth stages by weeds (Okoji, 1988). Weeding with the hoe is a back-breaking



operation; with the high temperatures and unreliable weather, it requires a great deal of labor averaging about 15 man-days per hectare when the rains start and 18 man-days when the rains are well set in. The difference in man-days arises from the fact that the soil becomes heavier in the latter period and therefore less easy to weed than during the former period. Generally, however, labor requirement for a specific operation is influenced by the distance of farm plots from the homestead.

### **Spatial Distribution of Holdings**

Excluding the Niger delta, the Obudu Uplands and the Oban Hills, southeastern Nigeria is densely populated, with over 600 persons per km<sup>2</sup> in such districts as Orlu in Imo State and Etinan in Akwa Ibom State. Given the fast developing dispersed, yet nucleated pattern of settlement in the region, one would expect farm distances to be close to the village. But it is rarely so. At Etebi Eket, for instance, farms are as far as 4.2 km from the settlement, depending on which block of farms is cultivated in a given year. In less populated areas such as Ikom, the distance exceeds 7 km. Under this circumstance, much time and energy is spent trekking to the farm so that it calls for more labor to complete the task which few people could have done if the farms were nearer. In a recent survey at Kakuagum Irruan, Ikom, the writer accompanied a gang of 11 workers which took 2.42 hours to arrive at the farm and worked for 6 hours, including lunch time, without staking all the yams on a 0.78 ha of land. The farmer reckoned that 16 people would have finished the job in less than 6 hours while it would have required 7 people if the farm were about 1.5 km from the village.

### **Cropping Sequence**

The point has been made that crops are planted in relay. Most often yams are planted first after burning since they require much nitrogen and potash (Harrison Church, 1974:101) and because they can withstand the high temperatures before the rains arrive. Following yams are assorted vegetables and, lastly, cassava, depending on the local staples and the ecology. This sequence presupposes high intensity of labor compared with sole cropping. Furthermore, crops must be planted early so that they benefit from the slow downward movement of soil nutrients with the early rains.

### **Seasonality of Operation**

Seasonality of operation depends on two factors, namely, the river regime in relation to flood plain cultivation and the actual change of season. In the Cross River flood plain at Itu, for example, the land is prepared as soon as the flood recedes and crops are planted in November while the land is still moist. Farmers make sure that the crops are

well-established before the dry season really sets in so as to provide a covering that will check rapid loss of soil moisture. In Obubra and Afikpo, gigantic mounds are raised for yams so that the crops are not affected even if the flood arrives earlier than expected.

In the upland areas the land is cleared in January-February and burned when signs of the first rain are observed. If the crops are not planted as soon as the rains break, they may not benefit from the considerable increase in the phosphate and exchangeable cation content of the top soil (Nye and Greenland, 1960) as well as the increased nitrate production when the soil is wet again. (Webster and Wilson, 1966:133).

It has been noted that weeds grow profusely with the rains and that weeding demands a great deal of labor in order to avoid weed competition with crops. It must be stressed that such a competition is capable of reducing final yield and no amount of subsequent cultivation will offset the loss. Peasant farmers are always sensitive to this consequence and therefore secure as much labor as necessary to weed their farms during this wet season.

#### **Social Activities**

Activities such as rituals and ceremonies may also affect the demand for agricultural labor. Among certain communities in the region such as the Annang of Akwa Ibom State and the Boki of Cross River State, farm work is forbidden on certain days and at certain times in deference to local gods. Although many aspects of tribal tradition have broken down, work-free days and times are still strictly observed because of the heavy penalties that are usually imposed on violators.

Furthermore, burial and marriage ceremonies usually keep off farmers and farm labor from work for five days or longer. In addition, rites and ceremonies on other occasions (like sacrifices before land clearing) as well as new yam festivals also consume labor time. The withdrawal of workers during these social activities ultimately means that a greater labor force will be needed to clear accumulated work. The burial ceremony of the writer's grandfather, for example, lasted three weeks and interrupted clearing operation. At the end, more than twice the normal labor force was secured to complete the task before the rains. In northern Cross River State, the annual new yam festival lasts for about two months (July-August) and is held on different days by different clans. Usually, the communities visit each other in rotation during the festive period and this deprives cocoa farmers in Ikom and Obubra of labor to slash their farms. At the end of the period, the undergrowth of cocoa farms becomes so dense that farmers have to seek for more hands.

### LABOR SUPPLY AND ORGANIZATION

In the recent past, the family constituted the major source of labor supply. Today, the supply from this source has been drastically reduced; even traditional sources are beginning to disappear. The effect of these developments has altered the structure of peasant labor supply and made family and traditional labor supplementary to hired labor. In this section, the various types of peasant labor are analyzed with a view to articulating the predicament of peasants in agricultural production and, invariably, the precarious position of food and industrial crop production since peasant farmers account for over 90 percent of agricultural output in Nigeria (Olayide and Atobatele, 1980).

#### Family Labor

In discussing family labor, it is important to note that although the differentiation between men's and women's farm tasks is becoming less marked in some areas, the division of labor between men and women still exists. Some operations such as land clearing, tillage, yam staking, and harvesting are specifically for men, while the sowing of food crops, weeding and harvesting of cassava are the functions of women. In addition to having their own specific tasks, men and women have farm plots as well as crops. For instance, among the Annang and the Boki, it is unusual for a man to own a cocoyam farm but men and women can own yam farms. In some cases, the farm may be owned by the husband while specific crops on this land are owned by the husband and wife. In a newly established oil palm farm in Annang, for example, cassava is often interplanted, with the man owning the palms and the wife the cassava. Similarly, in Boki and Osokom young cocoa trees are usually intercropped with plaintain, banana and cocoyam, the cocoa belonging to the man and other crops to the woman. The owning of specific crops on the land by the husband or wife does not shift any person's responsibility; each still performs his or her duty.

The structural change in family labor supply noted above has occurred because of increasing number of children at school, expansion of white collar job opportunities, loosening family ties, declining trend in polygamy, and rural-rural as well as rural-urban migrations. The survey at Kakuagum Irruan offers some empirical evidence in support of some of these factors. During this survey, 302 farmers were interviewed. Altogether, they had 1,607 children. Of this number, 675 or 42 percent were in primary schools, 537 or 33.4 percent in post primary and post secondary schools, while 82 or 5.1 percent were in the working class. This implies that 80.5 percent of the potential family work force was not available. The remaining 19.5 percent comprised those under school age and those who were not privileged to have formal education. Thus, the farmers depended on part of this 19.5 percent plus their wives for family labor.

With respect to the contribution of wives to family labor, Table 1 shows that less than 46 percent of the farmers interviewed had more than one wife each. It may be deduced from Table 1, therefore, that family labor is grossly inadequate for peasants. Coupled with this inadequacy is the fact that non-agricultural tasks are undertaken by available family labor and this must be taken into account in assessing their contribution to agricultural labor. Farmers' wives, for example, spend a considerable amount of time in search of fuel wood, water, marketing of small quantities of farm produce, carrying out domestic work and participating in communal activities. To cope with farm operations, farmers necessarily look for other sources of labor supply such as traditional groups and hired labor.

**TABLE 1. FARMERS' WIVES IN FAMILY LABOR FORCE**

| No. of Wives<br>Per Farmer | Percentage of Farmers<br>Per Marital Group | No. of Farmers<br>Per Marital Group |
|----------------------------|--|-------------------------------------|
| 1                          | 165  | 54.6                                |
| 2                          | 79   | 26.2                                |
| 3                          | 43   | 14.2                                |
| 4                          | 8  | 2.6                                 |
| 5                          | 5  | 1.7                                 |
| 6 and above                | 2  | 0.7                                 |
| <b>Total</b>               | <b>302</b>                                 | <b>100.0</b>                        |

Source: Author's field survey.

#### **Traditional Labor Groups**

These groups of labor including extended family groups, age grades and work societies do not appreciably ease the labor problem since they are fast disappearing. Their imminent disappearance is caused, among other factors, by the economic and social activities of the members, the level of self-dependence of extended family members, the quest for formal education by boys and girls, and the dwindling authority of work societies to penalize uncooperative members. In the past, work societies could seize with impunity any movable property from the house or compound of defaulting members; but today work societies attempting such an action are exposing themselves to court action. Repeated suits of this kind have seriously weakened the authority of work societies so that they are approaching extinction.

Age grade labor, particularly among children, has virtually ended except in such areas as Akpet in Akamkpa and Boje in Ikom where many parents prefer bringing up their children in their traditional way of living to sending them to school. However, age grade labor still functions among women on the basis of reciprocity, notably for cassava planting and weeding. Recently, however, church members in rural areas sometimes constitute themselves into work groups and hire out their services in order to raise funds for their churches.

### Hired Labor

The extent to which work groups contribute to the overall labor requirement in peasant farming is regrettably limited. This is because the functional work groups comprise women who cannot perform the strenuous farm tasks. The church work groups, on the other hand, have their targets and once these are achieved, they withdraw from the labor market. It is not a surprise then that in the survey referred to above, 74.5 percent of the farmers depended on hired labor while 21.1 percent depended largely on family labor.

Hired labor is obtained from a variety of sources (Table 2). The figures in this table are in percentages representing the proportion of farmers that engage labor from each of the sources indicated. In none of the Local Government Areas (LGAs) do the figures add up to a hundred since there are other sources of labor, although less significant.

Table 2 reveals some striking contrasts in the percentage of farmers drawing their workers from a particular source. For example, because of much smaller holdings in Abak compared with those in Ikom, many farmers in the former complete certain operations in a relatively shorter time and offer their services to other farmers who may need them. For this reason, coupled with the high rural population density, farmers here tend to depend more on labor from their villages than from elsewhere. In Ikom, on the other hand, the larger holdings demand a greater input of labor, and since the low rural population restricts the availability of local labor, farmers resort to other LGAs and states for labor, thus creating intra- and inter-state labor movements.

TABLE 2. SOURCES OF HIRED LABOR AND PERCENTAGES OF FARMERS DEPENDING ON THEM

| LGA  | Own Clan    |                | Own LGA Villages in Other Clans | Other LGAs | Other States |
|------|-------------|----------------|---------------------------------|------------|--------------|
|      | Own Village | Other Villages |                                 |            |              |
| Abak | 69          | 17             | 5                               | —          | —            |
| Ikom | 10          | 1              | 11                              | 17         | 57           |

Source: Author's field survey.

### LABOR MIGRATION

Labor migration in southeastern Nigeria is a relatively recent phenomenon but it is increasing in size consequent upon the deficiency of farm labor in many parts of the region and the expanding demand for food and industrial crops. Three forms of migration may be recognized, namely, short-term, long-term and permanent migration. The first comprises people who have moved to engage themselves in a single farm operation such as clearing, making of mounds, or weeding, or, for the whole farming season. The Ezzi people of Abakaliki are in this class.

They migrate during land tillage to Obubra and Ikom in Cross River State, and Afikpo in Imo State.

Long-term labor differs from short-term in that the former works for a particular farmer for a number of years before returning home. A considerable proportion of long-term migrant labor are target labor who return home after earning enough to meet specific targets such as the cost of timber or corrugated iron sheets for roofing, payment of bride price, redeeming of pledged property, or repayment of debts. Most of the Ibibio people working in peasant cocoa farms in Ikom belong to this group.

On the other hand, permanent migrant labor, as the name implies, are usually food crop producers. Initially, the men move to land-abundant areas where they are allocated farmland after complying with the customary requirements. Later, these migrants marry, produce children and live with their destination communities with hardly any hope of returning to their village.

Table 3 presents the sources and destinations of the three categories of migrant labor. From Table 3, a positive correlation appears to exist between rural population densities and the source regions of migrant labor. In general, the flow is from densely populated areas with densities of over 300 persons per km<sup>2</sup> to areas of abundant land and less than 150 persons per km<sup>2</sup>. Thus from the high population density areas of Enugu and Obolo in Anambra and Imo States, respectively, considerable migrant labor move to the Mamu River lowlands, the Anambra plains, the Nike district northeast of Enugu, and the Cross River plains of Afikpo (Agboola, 1979:15). From the Annang areas of Akwa Ibom State which also record high densities of population, long-term migrants move to Ikwere and Elele districts in River State, and to the food- and tree crop-producing areas of central Cross River State plains where the man-land ratio is very low.

TABLE 3. SOURCES AND DESTINATION OF MIGRANT FARM LABOR

| Source Region                        | Population/km <sup>2</sup> | Destination                                    | Population/km <sup>2</sup> |
|--------------------------------------|----------------------------|--|----------------------------|
| Ezza area of Abakaliki               | 320                        | Obubra and Ikom (land clearing and yam mounds) | 70                         |
| Ibibio areas of Uyo and Etinan       | 400+                       | Ikom (cocoa farms)                             | 70                         |
| Enugu and Obolo districts            | 450+                       | Mamu River lowlands (yam cultivation)          | 100                        |
| Annang areas of Abak and Ikot Ekpene | 400+                       | Central Cross River State (food crops)         | 40                         |
|                                      |                            | Ikwere (oil palm and cassava)                  | 120                        |

Source: Udo, R.K. (1972) and author's field survey and computations.

**The Effects of Farm Labor Migration**

Farm labor movements to and from destination areas affect both source and destination areas. This section summarizes the effects on the source region in relation to agriculture. In this consideration, farm labor migration restricts labor supply and the loss of the able-bodied from the source region may result in a reduction in the amount and variety of crops produced and in a deterioration of the local agricultural system (Hance, 1970:192). In Abakaliki, for example, labor shortage due to large-scale migration has adversely affected yam production in the flood plains but increased the cultivation of rice, a relatively recently introduced crop which is less labor-demanding than yam. Also, where climbing work such as pollarding of trees is to be done after clearing, the shortage of male labor limits the opening of new land and results in a general deterioration in agricultural production. This is the case in Ikono and Mbo in Akwa Igom State where large tracts of forest are untouched while the existing farmlands are cultivated more frequently at the risk of soil fertility.

Added to these undesirable effects is the incidence and spread of diseases since migrants' movement from one area to another may subject them to diseases to which they may have no immunity. For example, when migrant labor pass through malarious areas, they may carry fresh malaria infections to their destinations or back to their villages and thus build up and maintain a reservoir of malaria transmission (Prothero, 1965:31). Such transmissions can be fast in rural communities in the eastern states where medical and health care facilities are generally poor. The quick spread of such a disease as malaria certainly worsens the labor problem, both in terms of numerical strength and quality of labor as farmers suffer at least from the high fever and the disease's debilitating effects.

**COST AND PRODUCTIVITY OF LABOR**

Labor cost in peasant agriculture is complex in the sense that it varies with season, sex and duration of labor, i.e., whether short-term, long-term or permanent. The duration determines whether labor is paid daily, monthly or piece rate. Labor cost also varies, depending on the major economic activities of the community and the proximity of farming communities to urban centers. The effect of the season stems from the high demand of labor a few weeks before the rains and the peak demand when the rains arrive. Associated with peak demand is the rise in the price of labor although this varies from place to place for identical operations.

Of the different types of labor discussed above, family labor appears to be the only one that does not entail cash payment even though it involves other costs usually in the form of present and occasional financial

assistance to family members. Unlike family labor, those hired for the day charge different rates in different places irrespective of the identical jobs they perform. They also share in the usually lavish entertainment given to the day's work force, which the farmer seldom counts as cost. Table 4 presents the daily rates for identical operations in different parts of Akwa Ibom and Cross River states.

TABLE 4. VARIATIONS IN DAILY WAGE RATE FOR IDENTICAL OPERATIONS IN AKWA IBOM AND CROSS RIVER STATES

| Operation        | Village     | Nearest Town | Distance from Village (km) | Day's Wage(₦) |       |
|------------------|-------------|--------------|----------------------------|---------------|-------|
|                  |             |              |                            | Men           | Women |
| Land clearing    | Afaha Esang | Abak         | 11                         | 9             | —     |
|                  | Kakuagum    | Ogoja        | 46                         | 6             | —     |
|                  | Ikot Ebok   | Ikot Ekpene  | 19                         | 7             | —     |
|                  | Etebi       | Eket         | 24                         | 20            | —     |
| Cassava planting | Afaha Esang | Abak         | 11                         | 7             | 4     |
|                  | Kakuagum    | Ogoja        | 46                         | —             | —     |
|                  | Ikot Ebok   | Ikot Ekpene  | 19                         | 6             | 4     |
|                  | Etebi       | Eket         | 24                         | 16            | 7     |

Source: Author's field work.

Noticeable in Table 4 is the absence of hired labor for cassava planting at Kakuagum. This occurs because farmers' wives mobilize available family labor of age grades for this operation owing to the relative ease of pinning cassava cuttings on yam mounds.

Both long-term and permanent labor are paid monthly wages ranging from ₦50.00 to ₦80.00. They are common in Ikwere and Elele districts of Rivers State where, after the farming season, they are employed to harvest and process cassava for the urban markets of Port Harcourt and Aba. They are also found in Boki where they are engaged in cocoa farms to slash the undergrowth, and pick and process cocoa. In addition to the agreed wage rate, monthly paid workers are provided free accommodation, some scanty hard furniture and utensils as well as supplies of palm wine. Like the lavish entertainment, these provisions are rarely included as labor cost by most farmers.

Outstanding in Table 4 is the daily rated labor cost at Etebi, the highest in the four villages in both operations. This is because Etebi is in a riverine area with over 55 percent of its population fishing in the creeks and in coastal waters. And since half a day's catch fetches a fisherman more than ₦200.00, people who work on the farm charge high rates no matter the task.

A comparison of labor cost at Afaha Esang, Ikot Ebok and Kakuagum (Table 4) also reveals that, excluding Etebi, daily paid labor costs most at Afaha Esang. One important reason for this differential is distance from the nearest town. The implication is that farm workers at Afaha



Esang are aware of the daily wage rates paid to unskilled labor at Abak in the public and private sectors and therefore ask for equivalent rates. But, because of the distance from Ikot Ekpene, only very few at Ikot Ebok are aware of the urban rates; much fewer farm workers at Kakuagum know of what obtains at Ogoja which is 46 km away.

### **Labor Productivity**

Labor productivity in peasant farming is influenced by a variety of factors among which are individual qualities of labor (including the farmer), seasonal variations, and physical conditions of the land. Since some comments have already been made on the last two factors regarding their effect on labor, a brief examination of the first factor will be made here. Under personal qualities, therefore, there are such variables as experience, motivation and managerial ability which affect labor productivity. The more experienced the farmer is, for example, the better is the farmer-labor relationship which is very crucial if the farmer is to get the best out of his work force; and harsh farmers often find some of their workers uncooperative with them and other workers.

With respect to motivation, it appears from the writer's field observation among the Mende of Sierra Leone and the Annang and Boki of southeastern Nigeria that hired labor have less motivation to work hard than family labor. In the three cases, hired labor want a longer lunch time and to end the operation rather too early. This then raises the issue of the farmers' managerial ability to plan and execute his operations with the optimum input from available labor.

The farmer's managerial ability notwithstanding, it seems that the productivity of the peasant farm worker is generally low in terms of man-hours on the farm, in terms of physical performance per man-hour of work, and in terms of the output per man-hour of work (Olayide, 1981).

In respect of man-hour input on the farm, a considerable amount of time which should be spent on the farm is lost by workers. Some men attend to a number of ancillary economic activities like wine tapping and selling or buying of produce from morning markets, while the women attend to domestic chores before going to work on the farm. All these are accentuated by the long distances to be walked to and from the farm.

As regards physical performance, the effect of the climatic conditions has already been mentioned. It must be stressed here that because of the melting sun labor hardly work for three consecutive hours without some fifteen minutes rest. Also, if rain falls while at work hired labor are the first to seek for cover irrespective of its distance from the farm. Certainly, obstructions of this kind seriously affect both the performance and output per man-hour.

### CONCLUSION

With an estimated total population of 20.88 million people in 1980 (Olayide, 1980) and 75 percent of the working population employed in agriculture (Floyd, 1969:169), it is quite logical to assume that the eastern states of Nigeria are endowed with abundant farm labor. But from the foregoing analysis, it seems evident that labor is a critical and limiting variable in peasant agriculture. Thus, where labor is in "excess," supply is hard to obtain (Brown, 1964:54).

This difficulty suggests that the attitude of farm workers in the region must undergo a drastic change and their preoccupation with diverse subsidiary economic activities uncomplementary to agricultural labor minimized, if farm production is to keep pace with the rate of population growth. Achieving this change demands some policy considerations in terms of, among others, institutional organization of labor and migration, parity in wage structure for both rural and urban unskilled workers, and implementing agricultural development projects at the village level and gearing them to peasant farmers.

Furthermore, although agricultural science has been made a compulsory subject in primary schools in the region, it has not made the children appreciate the dignity of farm labor nor has it prepared them to work on the land. The situation may be remedied by making agricultural science a compulsory subject in the Central Certificate of Education examination. In this regard, marks for the practical examination in the subject should include a continuous assessment of work on individual farm allotment, which should be heavily weighted.

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## **BOOK REVIEWS**

**Pluckett, Donald L.; Smith, Nigel J. H.; Williams, J. T.; and Murti Anishetty, N.** *Gene Banks and the World's Food*. New Jersey: Princeton University Press, 1987. 247 pp., paper, index and biblio., illus., ISBN 0-691-084386-6.

The conservation of crop genetic diversity through gene banking is the central theme of this comprehensive book. The authors stress the role of gene banks in safeguarding crop species from permanent extinction and making many of them available to plant breeders who develop new crop varieties that are high yielding, resistant to pests and diseases, and tolerant to adverse environmental conditions. The major impact of gene banks, therefore, is seen as that of "serving agriculture now in the future."

Chapter 1 outlines the rationale for establishing gene banks by focusing on the need to boost agricultural productivity vis-a-vis human population growth. The chapter also discusses briefly the reasons for the decline in crop genetic diversity (genetic erosion) such as monoculture, land clearing, overgrazing, human encroachment and settlements, etc. Examples of the dangers of genetic simplification by way of monoculture are also mentioned.

In the second chapter, the authors explore the dynamic nature of present-day agriculture which is largely characterized by a rapid turnover of varieties, a condition known as the "varietal relay race," whereby varieties are retired and replaced when they no longer resist pests and diseases, usually after a period of four to ten years. The chapter also describes plant breeding strategies for prolonging the useful life of varieties, including the incorporation of two or more genes responsible for resisting pests and diseases. Seed production and certification are outlined and the controversial issues of multinational seed companies dominating Third World agriculture and the granting of plant variety rights to breeders (i.e., varietal patents) are discussed at length.

The history of germplasm collection and exchange from antiquity to modern times is the subject of the third chapter. The experiences of amateur and professional plant explorers who have been responsible for the growth and development of gene banks are also reviewed.

The operations of a typical gene bank together with its attendant problems are presented in Chapter 4. The more interesting section of this chapter, however, lies in the contentious issue of how plant genes should be conserved. Is it through planting in farmers' fields and natural

habitats or through gene banks? The authors provide arguments against the former approach by citing its apparent disadvantages (e.g., space limitations, relative unavailability to breeders, etc.) but favors the use of this same approach for wild species and fruit crops. In the end, however, the authors' biases toward gene banking are evident.

The rapidly developing field of biotechnology is discussed in the context of how this breakthrough is currently being utilized to great advantage by gene banks. The promise of biotechnology, however, can only be fulfilled when gene banks unconditionally supply biotechnologists with diverse germplasm to produce agronomically suitable plant varieties.

The most recent inventory of crop germplasm collection stored in gene banks worldwide is provided in Chapter 6. It has been noted that the number of accessions is not a reliable figure on which to base success in crop genetic conservation because of the large degree of overlap in collections and their comprehensiveness.

In Chapter 7, the authors take the view that payoffs from gene banks are difficult to quantify in monetary terms. They then cite the collective efforts of national and international agricultural research institutions in tapping gene bank resources and developing new crop varieties with single and multiple resistance to pests and diseases as well as those with tolerance to adverse soils and climate, which may well be the better indicator of gene banking success. Such theme is reiterated in Chapter 9 by narrating the development of the rice variety IR 36 as a case in point.

Wild relatives of crops are good sources of resistance to pests and diseases and also of tolerance to adverse environments because little or no care was provided them by man. Their importance in plant breeding work is thus underscored in Chapter 8.

In the final chapter, the authors summarize what have been done so far, the research gaps and what lies ahead for gene banks in the next century. An international funding scheme from private and public sources is proposed.

Clearly, the idea of gene banks as repositories of crop germplasm is founded on humanitarian grounds. It is ironic, however, that yields of modern varieties are unstable and that varieties are continually developed in a relay race fashion. Hopefully, this deficiency can be corrected in the years to come. Whatever the arguments are in favor of gene banks, skepticism about their true intent in developing Third World agriculture is bound to remain in many sectors of society.

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Campbell, Joseph K. *Dibble Sticks, Donkeys, and Diesel: Machines in Crop Production*. College, Laguna: International Rice Research Institute, 1990. 329 pp., diagrams, drawings, tables, paper.

With the continuous growth of population and the accompanying scarcity of food supply, agricultural production has become one of the major thrusts of Third World governments today. Several attempts have been made to remodel existing agricultural production systems in order to maximize the productivity of agricultural crops. Also, various technologies have been introduced and applied with the aim of improving crop production.

Campbell, is one of those whose aim is to improve agricultural output. In the book, he introduces the aspect of technological development in crop production. Vividly described are forms of agricultural mechanization which vary from simple hand tools to self-propelled harvesters. It also provides enough background information on the advantages and disadvantages of a specific type of machine. In his introduction, he emphasizes some points on a critical question: "Why mechanization?" He observes that in industrial countries, mechanization lowers crop production costs since it replaces labor with machines; however, this fact appears not to obtain in less developed countries where labor supply exceeds labor demand. He tries to prove that the standard of living of Third World farmers is partly determined not by underemployment but by total farm production. He stresses that farmers' use of power and mechanization is economically advantageous since it hastens the time for planting and harvesting and therefore minimizes crop losses. He supports his claim by showing that a 125-day rice variety yielding 3,000 kg/ha per crop has a cost of 24 kg/ha for each day the land is idle. With the use of machinery to speed up land preparation and planting of the next crop, an additional 24 kg/ha per day will be saved.

The first two chapters of the book deal with different powers and machines used by farmers to produce staple food and fiber crops. Various forms of human and animal powers were introduced. One of the issues considered is the efficiency of human labor as a source of power in doing repetitive jobs as compared to animals or engines. It is quite obvious that man cannot compete successfully with animals or engines in terms of power. However, in terms of jobs having low power requirements but demand decision making, human labor is obviously irreplaceable. Pursuing further comparisons, the advantages of using machines over animals surface when there is a disease spreading over a place. However, it appears that only the production loss in terms of animal power is considered by Campbell, with the loss in mechanical power being neglected in the discussion. Needless to say, if animals are prone to diseases, machines are also liable to suffer breakdown. The limitation

of the discussion is that there is no comparison between the costs resulting from the malfunctioning of animals and machines.

Another chapter deals with the agricultural production system, with the rationale that in order to recommend a tool or a machine one must first understand the existing production system. It is common knowledge that mechanization varies according to the agricultural production system being practiced in one country. Hence, the discussion on the different agricultural production systems, cropping systems, and types of soil compaction gives a good background information for the farmer.

The different farming operations such as tillage, planting, fertilization, weed control, insect and predator control, harvesting, grain drying and storage, and transport are tackled separately in each chapter. The presentation of the discussion is straightforward, with emphasis being given on the different machines and tools in current use. Supporting illustrations and tables make it easier to follow the discussion.

One of the chapters deals with the social significance of mechanization in terms of the consequences once mechanization is introduced in agriculture. The questions raised in this chapter are: "Doesn't mechanization make the rich richer and the poor poorer?"; "Does mechanization help produce more food and fiber?"; and "Does mechanization alleviate toil and improve the quality of farmer's life?". These questions are brought up because machinery can indeed replace humans in many agricultural jobs. The author cites criticisms pointing out that even if mechanization increases the output of the agricultural system laborers do not derive much benefit from it and continue to suffer from poor living standards. The author blames existing Third World social structures characterized by land tenure problems and inequality. He candidly clarifies that technological inputs such as agricultural machinery are unlikely to stimulate social change. The root of the problem does not arise from the introduction of new technology but from the inequality of distribution. The fact is agriculturists and engineers have already succeeded in increasing food production in less developed countries by introducing modern varieties, methods and machinery. He is aware of the fact that lack of agricultural mechanization in many Asian countries is due more to small farm incomes brought about by socioeconomic factors. This is supported by tables showing the amount of yield the farmers must sell to afford the purchase of machinery.

The last chapter is on the economic aspects of machinery. It describes how to estimate machine capacity, area worked, available time, fixed costs, and variable costs. This is significant for those who intend to purchase agricultural machines. Through this, they can determine whether it is feasible or not to acquire a certain farm gadget. Those who already own machines will have a basis in quoting rental rates in



order to offset expenditures. These the farmers can do at least in the realm of technology while the socioeconomic dimension is begging for restructuring.

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**FORESTRY SECTOR, DEPARTMENT OF ENVIRONMENT  
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- Conduct reforestation and rehabilitation of poorly/inadequately stocked, open and denuded logged-over/forest lands and watersheds, including improvement of grazing lands
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- Encourage rationalization of the wood-based industries and establishment of economic-sized processing plants/facilities
- Encourage and assist private landowners in the establishment of private forest plantations to augment raw material supply of wood-based industries and enhance environmental protection
- Promote the development of labor-intensive and employment-generating reforestation, agroforestry, Industrial Tree Plantation, tree farms and similar enterprises

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- Develop plans, programs, operating standards and administrative measures to promote effectiveness in forest management
- Assist in the conduct of monitoring and evaluation of forestry and watershed development projects
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