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INFORMATION SYSTEMS FOR DEVELOPMENT PLANNING

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DISCUSSION PAPER NO. 261

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January 1978

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### ABSTRACT

In this paper the changing approaches to development planning are described, from the economic-growth oriented strategies of the 1950s and the 1960s to the contemporary emphasis on alleviating poverty and meeting basic needs. The process of development planning includes several phases; the identification of aims, analysis, plan formulation and detailed design, implementation, controls, updating, and feedback and adjustment. This process has become much more sophisticated in recent years, but in general, the comprehensiveness and refinement of a development plan depends on the type and scope of the data available. At the same time, the very process of planning may reveal deficiencies in data and thus act as an incentive to improved information gathering.

Three information systems are needed for development planning: a resources information system, whose importance has been recognised for some time but which has frequently consisted of a series of isolated and uncoordinated inventories and studies; a scientific and technological information system; and a management information system, whose importance has frequently been neglected.

Information in these areas must be collected, communicated to government policy makers and administrators to meet their immediate needs, and stored in a convenient and coordinated form so that it will be accessible in the future. More global surveys and inventories will be needed during the early stages of development planning, and detailed project and programme surveys will be needed during the design and implementation stages.

## DEVELOPMENT PLANNING - SOME DEFINITIONS

Briefly, we may characterise 'development' as structural change plus growth. A number of people may object to this technocratic concept however, and may feel more at ease with the concept of 'progress' characterised as development plus a diminishing of social tension among groups within a society. Again briefly, we may say that planning is an organised, continuous process in support of the formulation, design and implementation of a set of development policies.

Within development planning we may distinguish a number of steps or phases. First would come the identification of broad development aims at the political level. Second is the analysis of past development, the current situation, the institutional structure, and the possible bottlenecks and development potential. Next is the stage of plan formulation which entails the formal acceptance of a consistent set of strategies, objectives, targets, policy instruments and means. Then a more detailed design is drawn up for the implementation of the policies which have been accepted. This involves the design of specific programmes and investment projects and the identification of responsibilities within the government bureaucracy and other organisations. After this, the plan can actually be implemented through the responsible departments and agencies. During this implementation process, a system of controls is carried out which involves the reporting of progress made compared to anticipated targets, the resources allocated and the projected time period. The plan is then updated through a continuous process of feedback and adjustment by which new situations and unexpected constraints are identified and dealt with and the necessary adjustments are made in the light of under- and over-implementation.

Development planning is a complex process involving many different organisations and administrators, including field staff and policy makers, planners, researchers, statisticians and citizen participants interacting in the formulation and execution of a country's socio-economic development. Planning represents an attempt to coordinate decision-making in order to give direction to and accelerate a country's development. This process involves choosing social objectives, setting goals and targets, disseminating information, organising infrastructures for implementation and coordinating and monitoring the development plan.

## HISTORICAL REVIEW OF DEVELOPMENT PLANNING

Before the 1950s, experience with development planning was limited to the U.S.S.R. and some European countries in the context of reconstruction efforts after World War II. The overruling objective was economic growth, and

in Western Europe this was carried out through a rehabilitation of the economic potential requiring a careful allocation of scarce capital resources, local and imported (e.g., the Marshall Plan).

In the late 1950s and early 1960s development planning was introduced in the Third World, partly as the result of pressures exercised by foreign donors. It was very much oriented towards one dominant objective, the growth of the Gross Domestic Product (GDP) through public sector investment projects. This required the identification of investment projects capable of absorbing loan funds productively in order to obtain foreign capital resources. It seems that this simple approach was influenced by the success of the Marshall Plan in Europe.

At a later stage when public sector investment planners were frequently confronted with the appearance of unexpected bottlenecks, a better awareness of the interrelationships within the economic system led to the introduction of a somewhat more sophisticated 'consistency approach' in planning, in which, on the basis of a 'forecast' of GDP growth, projects and resources were tentatively allocated over the various sectors and over time in such a way that the appearance of a disequilibrium within the economic system over the planning period concerned (frequently a period of five years) would be avoided.

In this somewhat naive period, development planning was often carried out as an ad hoc operation and, because of a lack of local specialists, there was a large input of foreign 'experts'. A number of criticisms of this approach have been raised including its ad hoc nature versus the need for a continuous process and the lack of a proper analytical pre-planning phase, partly the result of a lack of relevant data and analytical tools. In many cases development planning stopped in fact after the plan formulation phase, reflecting an underrating of the vital importance of a proper design and implementation phase and the need for real acceptance of the implications of development planning within government administration.

The stages of control, updating and feedback/adjustment require not only that information on the implementation of the plan be available, but also that this information be made available and processed quickly so that practical problems and constraints can be overcome without delay. This is essential if negative repercussions at the later stages of plan implementation are to be minimised and if the efficiency and performance of the plan are to be maintained. In the past, this stage has tended to be neglected because the appropriate information collection and processing infrastructures were lacking.

(Shah, Schaap and de Man, 1976 and Belshaw, Bjorlo and Shah, 1975). In spite of these difficulties development planning as an approach has become accepted in most government agencies of developing countries, as reflected, for instance, in the proliferation of planning units within the various ministries and departments.

Also, a number of qualified local specialists have gradually been trained abroad, and increasingly at local universities. In many countries the second level of decision-making is now staffed by specialists, and analytical tools and techniques have been mastered. The data gathering capacity has also increased, although unfortunately it is rarely used in a coordinated way.

In the 1950s, development was seen as an economic problem whose solution was based on achieving high levels of economic growth. It was thought that the differences between the economies of various countries were due solely to the different starting points of their development, and it would be only a matter of time until all countries would become 'developed'. The philosophy of economic growth oriented development was based on the assumption that, given fast rates of growth, the problems of unemployment, inequality, poverty, etc. would be solved in a 'trickle-down' process. In the 1960s, it became clear that the 'trickle-down' process was not working, and in fact with high rates of population growth, these problems were rapidly increasing.

At the moment, after a 20-year period of trial and error, a planning capacity has been built up and new dimensions of development planning have appeared on the horizon. Employment has been recognised as a structural problem that cannot be solved by high growth rates of GDP alone. Closely connected with the employment problem is the persistence or even worsening of a highly skewed income distribution; sharp fluctuations in the foreign trade sector; price increases of imported staple foods, energy, fertilisers, etc.; and high rates of rural-urban migration.

The small farmer, the seasonally unemployed landless labourer and sub-marginal farmer in the rural areas and the 'working poor' in the urban informal sector, these groups represent the major part of the population in the developing countries. These target groups should be and are bound to become the main concern of development strategies and planning, focussed on the 'basic needs' of the poor instead of leaving their improvement to the vagaries of some long-term, apparently ineffective 'trickle-down' effect of overall modern-sector economic growth. The GDP growth strategies of the 1950s and 1960s are being replaced by 'poverty oriented planning' where the aim of development is to raise the living standards of the masses of the people and to provide all human beings with the opportunity to develop their potential. This implies meeting their 'basic needs' (I.L.O., 1976) such as :-

- (1) Minimum requirements of food, housing and clothing;
- (2) Essential community services including clean water, basic sanitation, basic education, basic health services and basic transportation, and
- (3) Productive, worthwhile and continuing employment.

Also non-material needs such as the desire for self determination, participation in local decision making and self-reliance are considered. Recently another dimension of environmental policy has been added to the above 'basic needs' strategy. Experience in many countries shows that development has been carried out with little or no attention to the deterioration of the environment, and it is now recognised that planners should carefully consider environmental issues in the planning and evaluation of development programmes.

Although these aspects of development planning are now recognised as key issues in a large number of developing countries, in the context of development theory and practice there are different conceptual frameworks - almost philosophies - reflecting differences in the socio/economic/political environment, different variables and different central mechanisms. Following Jolly (1976) one might distinguish three broad conceptual frameworks in contemporary development analysis - the neo-classical, structuralist and neo-Marxist (see Appendix ). Even within a neo-classical framework where government participation in the economy is meant to be kept at a minimum, the recognition of the necessity of incorporating basic needs aspects in the development policies of Third World Countries - in a different way from the 'current transfer' strategies of the richer nations - inevitably results in more formal planning approaches. Also the need to cope with frequent external disturbances to the national economy, as well as external disturbances to sub-national (regional) economic systems, tends to bring about a more formal approach to planning.

While the development planning situation in past years could be characterised as 'single objectives/limited means', one may use for the new situation the catch words 'multiple objectives/multiple means' in an unstable environment. The periodic preparation of a five-year plan is not an adequate response to such a situation. To deal with the increased complexity of development planning, planners increasingly rely on the use of formal quantitative and non-quantitative systems methods for analysis and for the generation of alternative strategies to present to politicians and decision-makers. The importance of non-quantifiable aspects of development planning has come to the fore in recent years, resulting in the use of conceptual systems methods for problem analysis.

While the use of analytical methods at this moment seems promising - notably as planning techniques to trace the likely impact of different policies and sets of policies on development objectives, targets, etc. - a number of problem areas are already becoming apparent. For one thing, there is a clear need to coordinate basic data and information gathering with respect to quantity, format, quality and timing and in terms of current and future needs.

Against this background, one might look for the ideal design of a development planning structure to which the various actors involved would have to adhere. In fact, this would defeat the basic idea of a systems approach which aims to incorporate into the problem analysis the real-world situation of a 'suspicious, uncooperative and sometimes even hostile' environment. In reality, in the daily political context there is a need for frequent ad hoc planning and decision-making in a situation of almost permanent crisis. It is exactly in such a situation that the availability of analytical methods, of an appropriate data base and information system, and an awareness of the long-term direction of the development strategy on the basis of national, sectoral and regional perspective studies would assist in indicating to the policy- and decision-makers the likely implications of different policy alternatives.

#### INFORMATION AND DATA NEEDS FOR DEVELOPMENT PLANNING

In general, the type and scope of data available, and the socio-economic studies based on them, determine the comprehensiveness and refinement of the development plan. At the same time, the very process of planning may reveal deficiencies in data and thus act as an incentive for improved information gathering.

The information needs of development planners are very much dependent on the time horizon of the plan. Development planning in a particular country should be carried out not only on the basis of short-term (typically one to two years) and medium-term (typically five years) objectives, but also on the basis of long-term (typically twenty years) goals and targets. In the case of long-term development planning, numerous uncertainties, constraints and unexpected situations are likely to occur, and in general it is not possible nor desirable to have a detailed long-term development plan. However, the short- and medium-term plans must fit within some long-term development strategy (perspective studies) which may be characterised by the social, political and welfare goals that a nation wants and can achieve for its citizens in a period of one generation. In this paper we consider the information systems for the formulation, implementation and evaluation of development planning, particularly in the context of short and medium time horizons.



### Information Systems Framework

In its most general form, national, regional and sectoral development planning can be regarded as a process of information input and output. In this connection, we may follow Asmoro (n.d.) who distinguishes three types of information systems:-

1. The Scientific and Technological Information System, providing information on technology and science, being a network of reporting and library system.
2. The Management Information System, providing information for the purpose of management of an enterprise, a government institution, or a project.
3. The Resources Information System, also called Environmental/Geographical/Spatial Information System, providing information on the conditions of events within a certain geographical region (phenomena with spatial distribution characteristics).

The coverage and range of these information systems will be narrowed down when we consider them more specifically within the context of the needs of national development planning. Depending on the planning objectives, planning processes, planning horizons and planning means, the scientific and technological information system will have to be geared to the needs of local, national and regional planning (e.g., in the field of methodology), and to the needs of sector planners (e.g., AGRIS, an international system particularly geared to the needs of agricultural sector planning). The management information system must provide the relevant levels of government management (executing agencies, planning cells, etc.) with the appropriate information needed for the timely and effective decision-making required to direct and control ongoing implementation activities, at the project level as well as the level of broader policies. The resource information system should provide the bulk of essential static and dynamic information concerning the potential, current use and past trends in natural resources, human resources and national and regional (sector) accounts and economic and social aspects and indicators. Particularly in the light of more recent changes in the concept of development planning, information is also needed concerning the current situation and past trends in basic needs (quality of life, nutritional standards, employment, income distribution, etc.)

While the importance of the scientific and technological and the management information systems as essential components of any development planning information system has hardly been recognised in the past, the resource information system has been recognised as the backbone of plan formulation albeit in an uncoordinated and haphazard way. This has resulted in a proliferation of survey activities in the economic field, through a government's central statistical office and central bank. However, these data-

gathering activities are very much biased towards the needs of aggregate economic-growth oriented planning. In the social field, survey activities have been very much limited to data collection covering demographic, health and educational information, apart from some special isolated studies of a mainly academic nature. In the natural resource field, there has been a tendency to carry out uncoordinated surveys of the inventory type, covering hydrology, vegetation, soil, geology, etc., as well as the traditional topographical base map surveys.

As a reaction to the scattered information gathering in the resource field, there has more recently been a demand for integrated surveys. Under this umbrella we may observe at present three tendencies or fashions. There has been a tendency to strive for standardisation within any particular natural resources field and integration among the various natural resource survey fields. A similar tendency exists in the area of socio-economic studies, and among studies of special projects and programmes there have been efforts to integrate natural resources and socio-economic surveys, and more recently to consider the organisational and management aspects as well. The integration of natural resource and socio-economic surveys geared towards the users' (planners') information needs has rarely been achieved in the past except occasionally in the limited context of isolated special project and programme surveys.

If we use the term survey in the very wide sense of an information-gathering activity, we may depict the broad structural relationships within an information systems framework for development planning. Figure 1 depicts the relationship between the three information systems, the related survey activities, and planning, implementation and decision-making for development planning. The use of the term survey in connection with the scientific and technological, as well as the management, information system appears somewhat artificial. In fact, these survey activities will virtually disappear as soon as the regular information systems become effective.

The dashed lines in Figure 1 separating areas of resource survey activity show the traditional conceptual separation between natural resources and the socio-economic field. In addition to this, a completely new dimension of survey activities related to 'basic needs' is shown. In this connection, a real danger exists that the identification of 'basic needs' - the mapping of poverty target groups - might lead to another set of isolated survey activities without any provision for linking them with the natural resources and/or socio-economic domain. One major problem requiring serious attention is to ensure, where relevant, that survey activities are integrated and coordinated in the light of the user's (planner's) requirements.

Planning is carried out on the basis of the information from the survey activities related to the three information systems. Note that planning and implementation are interacting and are not treated as separate entities as was the case in the past. It is crucial that appropriate decisions be made during the implementation stage to account for new situations and constraints which become apparent. This relationship is shown in Figure 1 by the solid line between implementation and the management information system, the dashed line to planning and the solid line between management information and decision making.

As mentioned previously, external disturbances to the national economic system must be considered, and this is shown in Figure 1 by the international environment factor which affects planning and decision making related to national development.

#### INFORMATION SYSTEMS FOR DEVELOPMENT PLANNING

The concepts 'information', 'data', and 'statistics' are often used interchangeably in the same context. In this section we shall continue to use the term 'information' in its broad sense, covering these three meanings which may be described as follows: Data - primary quantitative as well as qualitative data; Statistics - quantified, not necessarily primary data; Information - (in its narrow sense) evaluated data and statistics, not necessarily quantified, used in the context of a communication need among various disciplines, agents, etc. Before we elaborate on the relation between information (surveys) and planning we will first deal with some more technical points concerning the collection and use of information and data.

#### Collection

We may make a distinction between the phasing and the quality aspects of information collecting. Phasing is very much related to a process of selection and rejection of successive information needs. Starting at the general level, in succeeding phases, fields are identified where additional or more detailed information is required, in a particular sequence, time or format. Phasing is basically a safeguard against the collection of superfluous or inadequate information, which not only means a waste of time and money, but which also may lead to blocking effective communication and implementation.

The quality aspect of information gathering is often wrongly identified with more detail and better coverage. At an aggregate level, a limited but well planned and executed sample survey may yield higher quality information than the aggregate of a detailed, large sample or census, due to the weight of non-sampling error. On the other hand, when there is a need

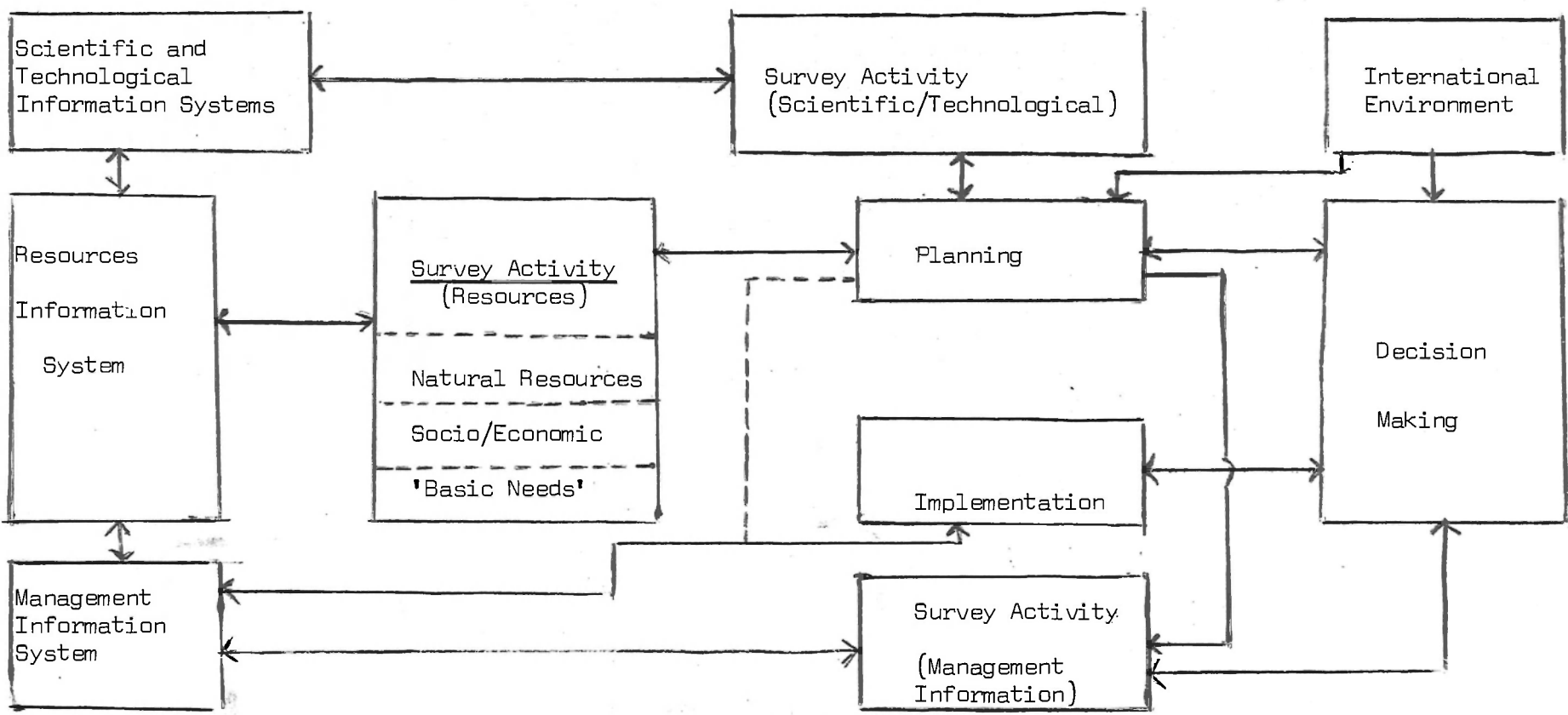


Figure 1: Information systems framework for development planning and execution.

to subsequently disaggregate an aggregate survey, for instance with respect to the spatial dimension of information, a complete coverage may be required. Planners, model-builders and project-makers are often to blame for either failing to specify the quality of information required, or otherwise, just as a safeguard, prescribing exaggeratedly narrow quality tolerances. On the other hand, the suppliers of information rarely specify the quality (margin of error) of their data, at which level of (spatial) disaggregation.

#### Use

Here we may distinguish two extremes: immediate use and future use. For the first type of information, a specialist determines what is required and immediately after use disposes of the information, with no coordination or storage problems. An extreme example is the use of satellite weather images for short-term weather forecasting. Information for future use raises more difficulties because even in its simplest form storage and retrieval must be provided. Where future use is to be made of static information of the inventory type, the time of actual use is often undetermined. A part of the collected data might be used very soon or only after a long delay. The piecemeal retrieval of information from a collection certainly does not imply its piecemeal, isolated use, which unavoidably leads to the need for standardisation within the collection. Where future use is to be made of dynamic information for comparison over time, there is, in addition, a need for standardisation over time. This does not imply that concepts have to be static, as long as keys can be used to ensure the required consistency. The flexibility to introduce conceptual changes over time will, in general, increase as more detailed, disaggregated information is stored and kept accessible (But at what cost?).

#### Information Needs

Figure 2 depicts a generalised survey/planning/decision-making structure with an emphasis on phasing in planning and tentatively a corresponding phasing in mainly resource survey activities.

Roughly we may identify the activities of the first and second rows of Figure 2 with the pre-plan formulation phase, those of the third row of Figure 2 with the plan formulation phase and those of the fourth and fifth rows with the design and implementation phase. Planning normally starts with a broad analysis based on identified development aims and existing and accessible information. In the process of analysis and in the dialogue with top political decision-makers additional information requirements - immediate as well as long term- are identified and data gathering activities initiated.

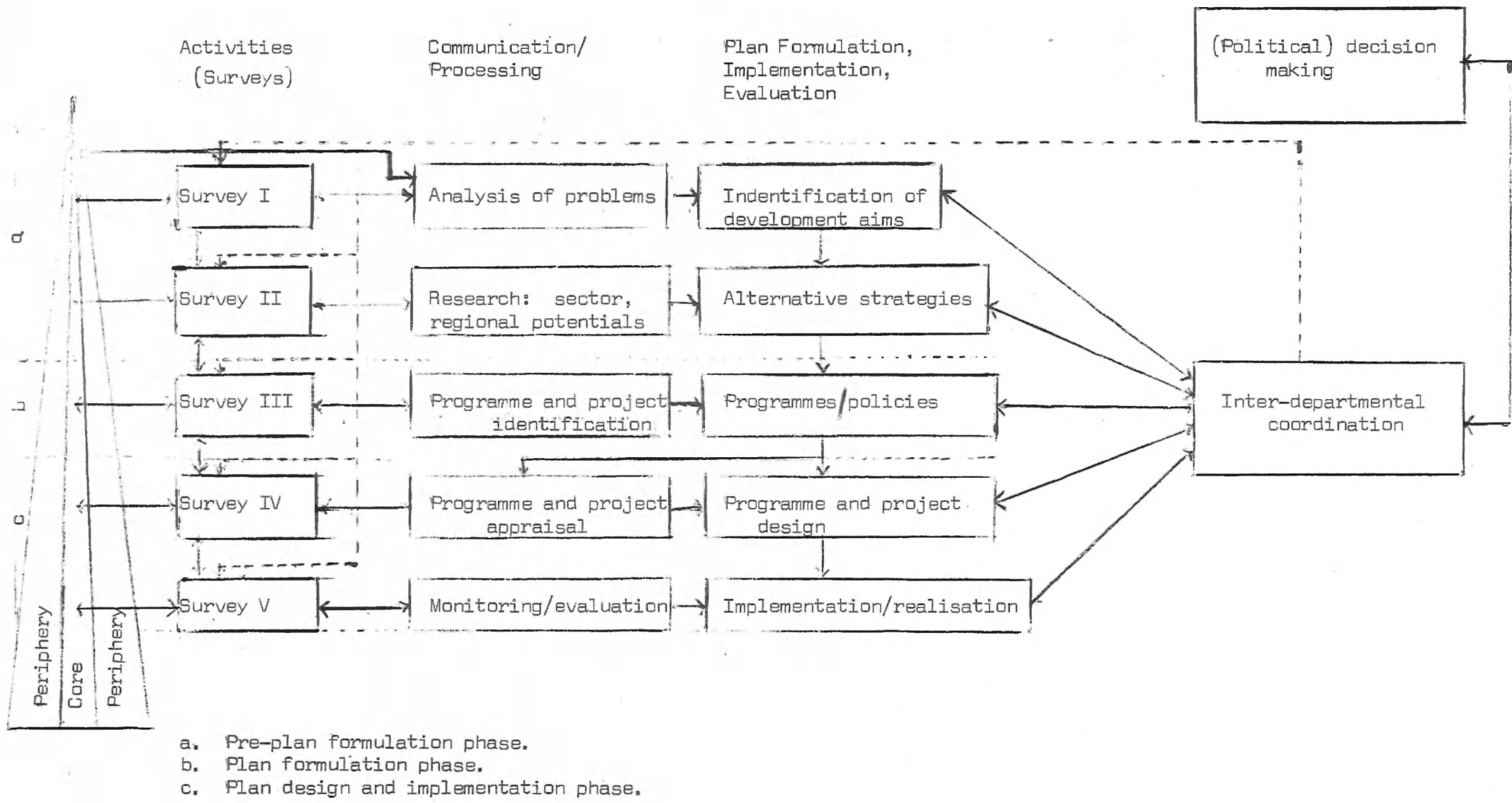


Figure 2. A generalised survey, planning and decision-making structure.

Such activities (often geared to the 'simple' transfer of information from the periphery of the data base to the core of the data base) may take the form of 'hunting' for already collected but poorly accessible information, including its (re)processing into a suitable format. They also may take the form of collecting new primary information on an ad hoc or more continuous basis. Quite often these will be surveys of the global inventory type, dealing with static (such as natural resource) inventories as well as with dynamic aspects, agriculture and population censuses and national accounts for example. This type of survey will be referred to as Survey I.

This general analytical phase will, after a number of rounds, be followed by another phase: the formulation of alternative strategies requiring research and a more detailed but still global assessment of sectoral and regional potentials leading to the identification of additional research requirements. This will be called Survey II.

Once a decision has been made on a consistent strategy, the structure of the plan will take shape. This requires the identification of potential projects and programmes, again requiring additional research - completely new or additional project and programme surveys. This stage is called Survey III. The real-life planning situation is complicated by the fact that many project and programme surveys require a long time period to be completed. For this reason, planning during a specific plan period is highly dependent on the research carried out in the previous period(s).

Particularly at this level, there is a danger of misunderstanding with respect to the content and function of the research activity. Earlier surveys, to a large extent, involved the collection of basic national, regional or sectoral 'data' and 'statistics'. Project and programme surveys, however, are generally the result of coordinated, multidisciplinary investigations in which a development planning function - implicitly or explicitly delegated from the planning centre - has been incorporated. These survey activities should be guided by the development strategies, aims and objectives which have already been accepted at the political level.

In order to ensure an effective and efficient execution of such project and programme studies a system of phasing should be initiated involving project identification and formulation, reconnaissance surveys, semi-detailed surveys and detailed surveys. In some cases an early stage of research might be skipped or performed very quickly where relevant and accessible information has already been collected. Unfortunately, the history of survey activities is full of examples where specialists, on objective or subjective grounds, have been unable or unwilling to use information collected previously.

One of the more objective reasons is that it often takes too much effort and time to transfer the existing but poorly accessible peripheral information to the relevant core of the data base. Another reason is that the quality tolerances of the required information are too narrow to be derived from information already available, but of unknown quality.

Another type of survey, survey IV, involves detailed design (engineering), financial and (not least) organisation and management aspects. In fact, in many cases it will be identical to the last detailed phase of project and programme surveys. The last type of survey, Survey V, related to monitoring, evaluation and updating, serves not only as a control on the performance of specific projects and programmes, but also as an early warning system for unexpected or unwanted side-effects of planned and unplanned development efforts.

In the developing countries the data base used for pre-plan formulation is still weak, dispersed, standardised on a piecemeal basis only and poorly accessible, which makes communication difficult. An exception could be made in the case of government central statistical offices, but their activities are generally very much biased towards the needs of aggregate, economic growth oriented planning, as reflected, for example, in the U.N. Standard System of National Accounts. To improve and increase the data base used for pre-plan formulation, some of the limited survey capacity of a country will be diverted from project and programme surveys, that give substance to sectorial and regional plan formulation, and from other types of survey. Basically, this is just another allocation problem with one special aspect common to all developing countries: the available resources are not adequate to build up the information gathering capacity to meet all needs. In this connection, one has to realise that in practice the core data base to a large extent has to be 'filled' from scattered information gathered in the context of previous project and programme surveys.<sup>1</sup> The explicit and early recognition of this important second role for project and programme survey activities can greatly facilitate the strengthening of the core data base, provided that a certain consistency and standardisation in format can be observed.

In the context of project and programme surveys, particularly in so-called virgin areas, a fair degree of coordination in information gathering within the survey cycle is normally achieved, but due to a preoccupation with the consistency of concepts internal to the survey, the external linkages often remain weak or blurred. In so-called non-virgin areas, the coordination of

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1. A frequently heard comment of central planners is that the most useful part of project and programme survey reports is the statistical annex.



internal and external information is even more difficult. Very often a completely new set of information is being gathered which is conceptually different from the available 'administrative' information and creates other linkage problems. In the earlier phase of such project and programme studies the need for external linkages is less obvious than in the later phases, so that eventually all sorts of unexpected, ad hoc, adjustment problems are encountered.

#### CURRENT DATA COLLECTION PROCEDURES AND NEW CONCEPTS IN DEVELOPMENT

The collection of relevant information has to be seen in the context of the information needs of the various agents involved in planning and of those traditionally charged with the gathering and supply of information (statistical apparatus). In colonial times information was generated mainly through registration, geared to the administrative and bureaucratic needs for control, taxation, maintenance of law and order and a balanced (or surplus) budget. To a large extent, it was a decentralised operation designed to meet a few limited central needs, apart from specific local and departmental needs. In the social field there was a need for demographic and health statistics. In the economic field information was needed on prices, foreign and local trade, traffic, etc., often in one way or another related to the tax base. The spatial dimension of such information was mainly limited to the administrative unit.

The basic structure of the currently prevailing statistical apparatus still reflects this origin, although the central statistical offices of Third World countries have gained importance, mainly as service institutes to the governments and central planning agencies. As such, they tend to be biased towards the provision of yearly information in the economic field, such as national accounts, foreign trade, agriculture and population censuses, household budget surveys, etc. With respect to national accounts, data collection activities are very much guided by the U.N. Standard System of National Accounts (SNA), with little thought to the problem of measuring poverty at a national, regional or sub-regional level or of diagnosing its causes and the impact of government policy. More recent proposals to extend the SNA system by linking it with demographic, manpower and social statistics represent a step in a somewhat different direction. To illustrate how difficult it is to achieve a standardised system of information gathering for government planning, it is interesting to note that even in the field of national accounts in many cases competing estimates are still being prepared by the national bank, the central statistical office and even the central planning office in the same country. In the field of natural resources the collection and processing of statistical data is typically still the domain of the specialised departments, with little

concern for interdepartmental coordination of timing (regional priorities), format and detail.

Current planning information-gathering activities, mainly geared to the needs of modern sector output, have also so far virtually ignored the production activities in the traditional agriculture, the urban informal and the rural sectors and ignored even more information centred on households as the basic earning and spending unit. The new concepts of 'poverty-oriented planning', 'basic needs', self-reliance and environmental aspects of development planning require data and information which are very different from what has hitherto been the scope and function of the statistical apparatus. There is a dilemma in that it takes years to plan and implement the collection of new types of information and yet this information is urgently required for the introduction of the new concepts in development planning. A further difficulty is that it is not yet clear what kinds of data and measures are necessary to quantify the new concepts. For example, the solution to the problem of poverty requires not only the identification of the target group of the poor, but also an analysis of the causes of poverty. This poverty-oriented development strategy requires disaggregated information on employment, incomes, access to goods and services, standards of living, the quality of life, health, nutrition, sanitation, security, welfare, communication, social stratification and mobility, political participation and awareness, environmental aspects, etc. These aspects include complex social and economic elements which may not be measurable. There is an urgent need for the formulation of socio-economic indicators (Baster 1975) to meet the statistical needs of today's development planning. These statistical needs include data and information not only to identify existing social and economic conditions, but also to analyse and evaluate the impact of various development policies and programmes. The classification of information for growth-oriented planning should be by type of activity, while for welfare-oriented planning the object of statistical investigation should be the household, since this is the primary income-sharing unit. 'In the case of most small-scale agriculture, this question would not arise, since the household is not only the income sharing mechanism but also the unit of production.' (Bienefeld and Godfrey 1975).

Bell and Duloy (1975) consider the statistical priorities resulting from this new orientation in development. As a first priority, they set out a method for drawing the 'poverty contours/profiles' in the rural and urban informal sector with the household as the basic unit in the data collection framework. The new data should make formal quantitative analysis possible, as well as the more informal, rule-of-thumb approach, leading to the formulation of poverty-focussed programmes and the monitoring of the effects, over time and in various geographic areas, of different policy measures.

Similar priorities in filling the gaps in the data base are described by Pyatt and Thorbecke (1976) in the context of an elaborate social accounting matrix, but without explicitly mentioning the spatial dimension.

A development policy that gives substantial weight to the mobilisation of local resources - mainly rural seasonally unemployed labour, as well as local management and motivation - should be based on 'quantitative' information concerning the potential and seasonal/spatial distribution of this surplus labour resource and its correlation with other indicators (the physical and socio-economic environment). Only in this way can the allocation of scarce central (catalyst) resources and the removal of local barriers be carried out efficiently, except in the case of a development policy based on extreme self-reliance at the local level. At present, we lack the resource information base necessary for development planning aimed at basic needs (employment, redistribution of assets through the channeling of credit and land reform, etc.). Such an information base is essential for the identification and subsequent analysis of the problems faced by the target groups and the planning of feasible remedial actions.

While Figure 1 presents the broad structure of the relationship between information systems and planning and Figure 2 presents the relationship between the resource information base, the surveys that are conducted and planning, Figure 3 provides an outline focussed on specific target groups with the role of resource surveys and the type of policy instruments and government development planning activities required to affect these target groups. These government activities depend, of course, very much upon the institutional and political environment and the administrative capacity. Particularly where the administrative capacity is limited, planning is required to channel this capacity to reach the target groups as effectively as possible. The need to assign priorities also applies to the limited data gathering of most developing countries. The target groups themselves need to be informed concerning the results of surveys conducted, particularly when planning efforts include the mobilisation of local resources and these target groups are expected to participate in their own development programmes.

#### CONCLUSIONS

The experience of the last two decades shows that planning in many developing countries has failed to achieve any real measure of development. One of the reasons for this disappointing performance is that economic-growth oriented planning based on the 'trickle down' theory did not solve the basic problems of development which include poverty, inequality, unemployment,

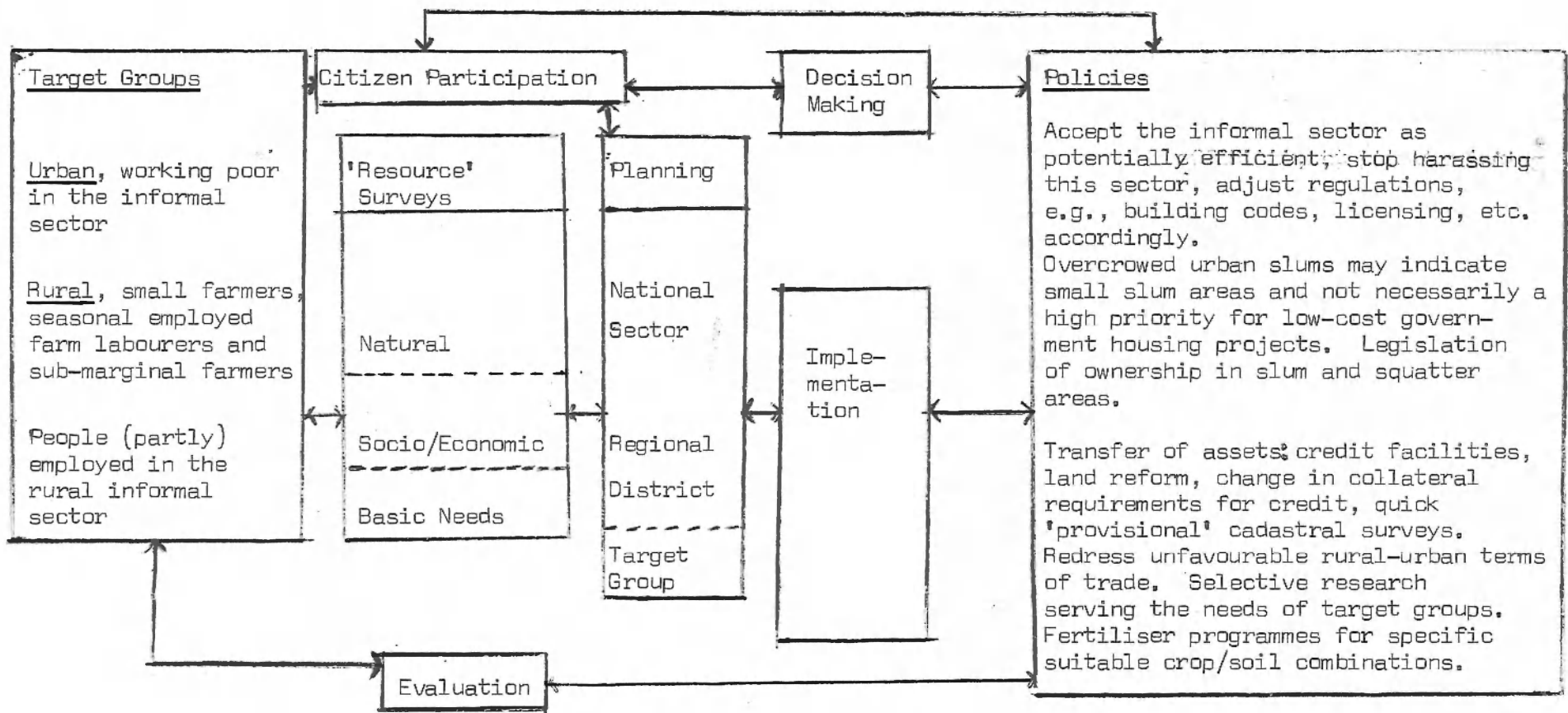


Figure 3. Information systems framework for poverty oriented planning.

etc. It is now recognised that the central aim of development should be the fulfilment of the 'basic needs' of the mass of the population, national self-reliance and harmony within the physical environment. Another reason for the poor performance of development planning has been the lack of an integrated information and data gathering system and the lack of an analytical framework for development plan formulation, implementation, updating and evaluation. The aspect of updating during the plan implementation period is crucial, since numerous new situations and constraints arise during the implementation stage and often the success of the plan depends on how the development strategies are redesigned to take these changes into account.

The success of a development plan depends to a great extent on the availability of relevant and timely information and data. Here we have considered an overall information systems framework comprising a natural resources information system, a scientific and technological information system and a management information system. The third system is essential for successful plan implementation and updating. Within this framework, an integrated information system for development planning has been described which is suitable, not only for the identification of development problems, but also for the design of specific programmes and projects and the implementation, updating and evaluation of all the components of the overall development plan. Within this system, the questions of data storage, retrieval and processing from a central data base have also been considered.

The information and data needed for the new concepts in development planning are very different from that needed for economic-growth oriented planning. It is important that the present statistical apparatus in developing countries be adapted to the task of gathering new types of information and data. A systems approach to the design of relevant data gathering operations has been described here, but there is still considerable scope for further research - on development theory, on the formulation and understanding of socio-economic indicators and measures, and on target group and poverty-oriented development planning.

The challenge faced by planners, statisticians, economists, sociologists, engineers, government decision-makers and private citizens is to identify the problems and priorities and to collect the relevant information and data that are crucial for effective development planning. A significant advantage of the information system presented in this paper is that it forces all these participants in development planning and implementation to work in an integrated and harmonious manner.

APPENDIX: KEY ELEMENTS IN THE MAJOR SCHOOLS OF CONTEMPORARY DEVELOPMENT ANALYSIS

	<u>Key points of focus</u>	<u>Explanatory variables</u>	<u>Typical policy recommendations</u>
IDS/DP 261	<u>Neo-classical</u>		
	allocation of resources	prices and wage structure	'put prices right'
	conditions for market equilibrium	supply and demand characteristics	tax, subsidy and tariff changes
			international free trade in line with comparative advantage
			investment to maximise rates of return
	<u>Structuralist</u>		
		demand and supply structures	indicative planning
19	income distribution	inappropriate technology	structural and institutional change, especially land reform, education, control of industry, self-reliance and moves to a new international economic order
	sectoral growth patterns	imbalances in power, national and international	
	balance of payments constraints		
	imbalances in employment	interest groups	redistribution with growth
		population growth	control of multinationals
	<u>Neo-Marxist</u>		
	accumulation of capital	ownership of capital	moves to state ownership and control
	extraction of surplus by developed countries from less developed countries	class structure	break with world capitalist system
	transition from feudalism to capitalism	reserve army of unemployed	central planning
	to socialism	role of state	

Source: Jolly, 1976.

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