

# FORESTRY AND THE TIMBER ECONOMY IN ECONOMIC DEVELOPMENT

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SELOSTE:

*METSÄ- JA PUUTALOUDEN VAIKUTUS TALOUDELLISEEN KEHITYKSEEN*

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The article deals with differences in economic growth in different countries and regions and with reasons for these differences. The central role of investments in economic growth and the mechanism of its differentiation are elucidated. The properties of forestry and the forest industries in equating or differentiating economic growth are considered. In the light of the theories of regional differentiation, the mere production of rawmaterial in some region tends to increase differences in economic development if that rawmaterial is processed in some other region – despite the fact that the level of income rises in both regions. It is therefore desirable that afforestation projects in the development countries are accompanied by the development of the forest industries.

## INTRODUCTION

Development (social and economic), as well as other concepts referring to the achievement of essential aims of society, do not mean the same to everyone. Some consider it desirable to increase goods and services, while others believe in some other, more abstract concept of development.

In this paper we shall adhere to the concept of economic development that refers to increasing goods and services. It is then assumed that democratic institutions in each society determine the objectives for development in a way that represents the distribution of goods and services aimed at by a majority of people. The objectives of society then reflect the aim of satisfying both material and intellectual needs. In Finland for example, the negotiations on income policy, carried out at regular intervals, as well as claims

implicit in topical political issues, emphasize these kinds of social values.

Different views also exist as to how the degree of development of society should be measured. Since the unique measurement of social welfare and its changes is impossible, the development of society is most often measured using its closest operational counterpart, the gross national product and its growth. Despite its several handicaps, it is one of the most efficient indicators of development, and it is most often used in international comparisons concerning both developed and developing countries.

Thus, an important aspect of development is economic growth, which refers to actual or relative growth of the national product during a given period. The point of interest is, then, the possibility of creating or main-

taining economic growth. The theories of economic growth<sup>1</sup> deal with this problem. Investments occupy an essential position in explaining economic growth, especially where there is unemployed or under-employed

<sup>1</sup> For example, Harrod-Domar's growth model, the neoclassical growth model, and the neoclassical model of balanced relative growth. See, e.g., GLAHE F. R. 1977. *Macroeconomics: Theory and policy*. New York-Chicago-San Francisco-Atlanta p. 358-377.

## REGIONAL INEQUALITY OF ECONOMIC GROWTH

We speak of developing countries and developing regions, on the one hand, and of developed countries and regions, on the other. Theories of economic growth explain how growth takes place as an interaction between certain economic variables. The theories of regional differentiation of society explain why economic growth is regionally differentiated and what social aspects influence the decisionmaking required for economic growth.

Statistics show that the rate of economic

labour. In developing countries the employment rate is generally low, thus emphasizing the role of investments in planning economic growth. However, also in developed countries, where the rate of employment is high and where production can be increased in the main by improving productivity (= output per input unit), it is understood that the new technology required for such improvements is embodied in recently produced capital goods and thus in investments.

growth in different countries and in different parts of a single country may be different. There are countries with little economic growth. On the other hand, it is well known that regional differences in development tend to become larger both nationally and internationally. The mechanism responsible for differences in development has been studied, for example in Finland, resulting in a general theory. A brief summary of this theory is as follows.

## ECONOMIC CHANGES

Suppose industry is established in an area earlier not industrialized. The following influences will then become apparent:

- Capital, expertise and services tend to accumulate in the industrialized area. These *accumulation effects* tend to create the prerequisites for an increasing invasion of capital, professional skills, services etc., to the appropriate area because, for example, the rate of taxation declines, thus creating new opportunities for investment, and because a large number of consumers of goods and services are generated there.
- While the accumulation effects continue they tend to spread out to the periphery, to the areas with *spread effects*. This may be due, for example, to the rising cost of housing in the area with accumulation effects. Workers and salaried employees move to the periphery and thus make it



Fig. 1

possible to establish service industries and to lower taxation rates. Hence, new opportunities are created there also.

- Since labour and capital are finite in quantity, they must deplete somewhere if they accumulate somewhere else. Thus, for example, the drain of labour from *backwash areas* is accelerated by increasing education which encourages the migration of people to areas with accumulation and spread effects. (See Fig. 1.).

A prerequisite for the development described above is that there exist such social values in society as can initiate and maintain it. In an unindustrialized (traditional) society the social values centre on beliefs creating conformity of people's behaviour, established customs which alienate new development. Industrialization (= increasing division of labour) is required to break the set of traditional social values (mechanical solidarity). The values created with advancing

industrialization are occupationally oriented, they emphasize the strive for efficiency and organization of people according to occupational aspects (organic solidarity). In this way, industrialization creates prerequisites for itself: the process of development is cumulative.

Another prerequisite for the cumulative development briefly described above is that labour and capital can move freely. These conditions hold reasonably within one country or even a free-trade region. Internationally, however, there are considerable limitations.

Universally, each *culture* has its own social values. Industrialization always means some degree of a cultural change: social values and culture are linked with each other, and so are changes in them. This does not, however, mean that a whole nation would have to lose its national identity as a price for development.

## A DERIVATIVE OF THE MODEL PRESENTED: AN AREA PRODUCING RAWMATERIAL AND AN INDUSTRIALIZED AREA

Suppose that an area (e.g. a country) is divided into two distinctly different parts: an industrialized area and another area producing rawmaterial for the industrialized area (Fig. 2). It is then obvious that little capital formation will take place in the area producing rawmaterial, i.e. there is little investment into industry. There are producers of rawmaterial, tools and machines which require some goods and services, but the commodities used by them are produced in the industrialized area. The income (production) of the industrialized area therefore tends to rise faster than that of the area producing rawmaterial. In other words, there will be a difference in development: an increase in the quantity of rawmaterial produced in one area results in an increase in its processing in the other area.

Accordingly, if Lapland, for example, produces the rawmaterial which is processed elsewhere, this province will develop slower than the rest of Finland. This development cannot be prevented even by a price policy with a practicable range. The prices of raw-

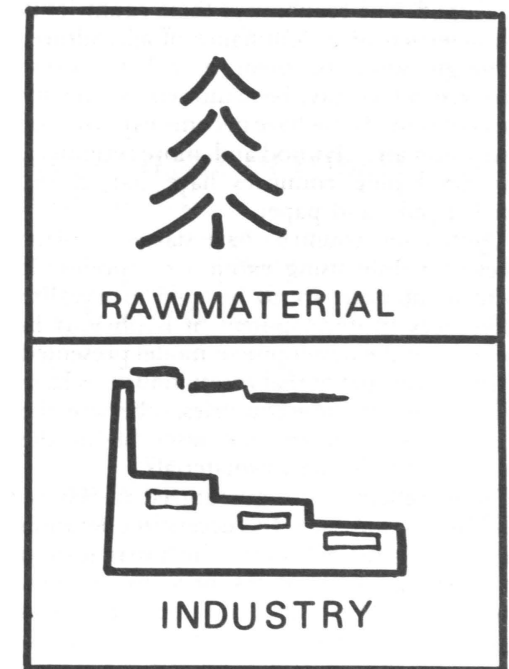


Fig. 2

materials can be fully reasonable, even unreasonably high, and yet there will be a difference in development. It is therefore obvious that, if timber is grown in an unindustrialized area enjoying, for example,

increased state subsidies for forestry, this subsidization does not narrow differences in development between this area and others, but tends to increase them in the long run.

## DECREASING DIFFERENCES IN DEVELOPMENT WITHIN ONE COUNTRY

There are two alternatives for equalizing differences in development: either we transfer income from the industrialized area or we erect industry in the area producing raw material. The third possibility is a combination of these two. Within one country — assuming an open economy — there is usually some reason why all its regions do not become industrialized. Most often this reason is unfavorable location, i.e.

transport costs are unreasonably high, tending to direct industry elsewhere. In that case, the industries in the developing region may be supported by economic policy means, even by government subsidies to cover their possible losses. Another alternative would be to give up the industrialization attempt and transfer income using more direct, perhaps more frustrating means, and overlook certain important aspects of development.

## ALLEVIATING BACKWARDNESS OF A DEVELOPING COUNTRY

Often, a country as a whole remains underdeveloped. The economy of these countries is characterized by a dominance of agriculture, although some of them may have forest resources which have been utilized to diversify the economy. Some have become exporters of sawnwood and plywood and, more recently, a few developing countries have started exporting pulp and paper.

Quite a few countries have started to plant forests, mainly using exotic tree species. If these plantations are to be used to equalize differences in development, it is obvious in the light of the development model presented earlier in this paper that forest industries have to be erected in these countries, otherwise the situation will remain the same as in the countries producing raw materials.

Development is not guaranteed merely by establishing industry. Its successful operation has certain preconditions, which may lead to far-reaching consequences for many societies. Their development does not occur merely as a result of apparent production. It is necessary to reach a certain relationship between output and the inputs (labour, capital) used in

producing the output: to reach a productivity which ensures for the product a price higher than the production cost. Otherwise there will be a loss from which it is impossible to invest. Investments from profit, however, are indispensable for autonomous development.

If it is not possible to invest from profit, one must (1) refrain from investing, (2) obtain the funds for investment as a gift or (3) as a loan. The first alternative means forfeiting rapid development. International development aid may be obtained as a gift for some time, but not infinitely. A loan burdens the balance of payments of the borrowing country for prolonged periods unless productivity rises quickly to the extent that exports can be increased faster than imports.

Since the production of investment funds, even after establishing industry seems, in some countries, to meet with difficulty, we may enquire the reason for this.

On the basis of what has been presented above, and condensing the wide scope of reasoning by WEBER (1947), MYRDAL (1957) and Olavi RIIHINEN (1965), we get the following flow chart:

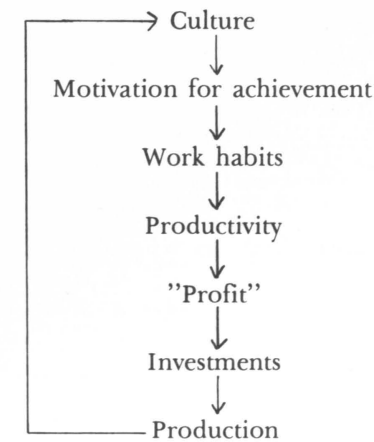


Fig. 3.

This scheme displays the view held by social scientists that *culture* — taken largely — contains the social values which are manifested in people's different aims and in means used to achieve them. Motivation for achievement, which is embodied in culture, deals with efficiency varying with culture. Production, once it has been established, i.e. industrialization, tends to change the social values embodied in culture in favor of production, as we pointed out earlier. The gradual outcome of this process is in fact *the social change* implicit in development.

## ECONOMIC DEVELOPMENT AND INVESTMENTS IN FORESTRY AND THE TIMBER ECONOMY

Future consumption prospects of forest products are the customary motivation for developing forestry as they form a basis for development programs. Other materials can, however, be substituted for wood. Therefore, there must be special reasons why wood should have an outstanding position in economic development. WESTOBY (1969) is of the opinion that foresters have not yet sufficiently understood the economic growth effects of forestry, or they have not presented them seriously enough.

Although the factors favouring forestry and the timber economy in development investments should not be overstressed, their listing is significant and they should be

If we assume that work methods, remuneration and other conditions are the same, and that the economies of scale do not affect the work performance, work habits largely determine what the economic outcome (profit or loss) of a development project will be.

The amount of "profit" or "loss" in turn determines the level of investment into pre-existing or new production. In development, we are dealing with the fact that (a) a culture containing a sufficient motivation for achievement creates such a production as can bring about increases in production; (b) social values in the culture change, thus bringing about new work habits. A precondition for development is that the autonomous rotation shown in Fig. 3 can be initiated, e.g., by investments from outside. Development aid, as suggested by Fig. 3, is most appropriately directed to investments. On the other hand, each country should, in its development program, pay special attention to the selection of investments.

It is noted that social values favorable to industrial development (the strive for efficiency) may not emerge until a long time after the establishment of industry. It is, therefore, desirable that, in industrial development projects, the post-establishment management is supplemented by people from industrially oriented societies.

considered in connection with each development project. The most important aspects may be the following (cf. WESTOBY 1962):

- (1) Forests are a versatile renewable resource which can be used to produce many products.
- (2) The income elasticities of several forest products are high at low income levels (cf. Table 1), i.e. a small relative increase in income is accompanied by a large relative increase in consumption.<sup>1</sup> This

<sup>1</sup> Income elasticity refers to the ratio of percentage change in paper consumption to the corresponding percentage change in income.

Table 1. Income Elasticities of Demand for Paper from an Earlier Study  
Taulukko 1. Paperin kysynnän tulojoustoja

GNP per capita in 1975 Dollars <i>BKT henkeä kohden, v.n 1975 dollaria</i>	Newsprint <i>Sanomalehtip.</i>	Printing & Writing <i>Paino- ja kirj. pap.</i>	Other Paper <i>Muu pap.</i>	Paperboard <i>Kartonki</i>	Total Paper & Paperboard <i>Yht.</i>
High Income Countries (3,000–8,000)	0.4–0.8	0.5–0.9	0.5–0.8	0.9–1.3	0.7–1.0
Medium Income Countries (1,500–3,000)	0.8–1.1	0.9–1.2	0.8–1.1	1.3–1.6	1.0–1.3
Low Income Countries (750–1,500)	1.1–1.5	1.2–1.6	1.1–1.5	1.6–2.0	1.3–1.6
Very Low Income Countries (100–750)	1.5–2.9	1.6–2.8	1.5–2.6	2.0–3.0	1.6–2.6

Recent work by FAO, based on annual data of the period 1961–1975, for 43 individual countries considered simultaneously, provides good evidence of the level of income elasticities.

Source: FAO. 1977. Demand, supply and trade in pulp and paper: trends and prospects to 1990. FAO Advisory Committee on Pulp and Paper. Tunis, 20–22 September, 1977.

applies in particular to paper consumption. Wood consumption in many developing countries may therefore become fairly large. The development of forestry and the timber economy then makes an efficient contribution to economic growth. The data used in computing the coefficients may, particularly in developing countries, contain a statistical bias. The forecasts of paper and paperboard consumption for developing countries in any case show a considerably larger relative increase in 1980–1990 than do the forecasts for developed countries (Table 2). The relative increase in paper consumption in developing countries seems to be more than twice as large as in developed countries.

(3) Forestry and the timber economy has a considerable effect on other industries. Its exports enable the imports of raw-material and capital inputs (mainly machines) required by the other industries to be effected. Moreover, its products are used as inputs in several industries. It is customary to regard an industry as a primary one on the ground that it does not use products from other

industries. However, modern forestry uses as inputs machines, seeds, fertilizers, etc. This influence becomes greater if we consider forestry and the timber economy as a whole. Forest products are used as inputs in many fields. Forest industry products, e.g. paper and paper products, sawnwood and other wood industry products, are used as inputs in many other industries. This aspect is recognized in that, when planning economic development, attention is paid to what extent the expansion of a proposed activity uses, as inputs, products from other fields, and to what extent other activities use its products as inputs. We then say that forestry and the timber economy has a considerable backward and/or forward linkage.

(4) The forest industries may shorten the "repayment time" of investments into infrastructure (e.g. roads, electricity, communications, water supply, etc.). Likewise, they may promote industrial development where the social costs are lowest.

(5) The forest industries rank high when considering the substitution of domestic production for imports or increasing exports.

(6) The forest industries use a local source of rawmaterial, which can be established and regenerated.

(7) Forestry and the timber economy can be adapted to what timber assortment is harvested; what rotation period is applied; what kind of industrial process is used (sawmill, paperboard mill, block-board or pulpmill). Mechanization and capital intensity can be adapted to the degree of development and the amount of capital available; this may be of considerable significance for developing

countries with limited industrial opportunities, weak infrastructure and scarce capital.

(8) Since a large share of the forest industries is at rawmaterial sources in rural areas, they further the dissemination of technical information and help people transferring from subsistence economy to industrial economy by providing paid employment. The need for labour often constitutes a supplement to agricultural employment and facilitates the integration of agriculture and forestry.

Table 2. Outlook for Paper and Paperboard Consumption.

Taulukko 2. Paperin ja kartongin kulutuksen näkymät.

	Newsprint <i>Sanomalehtipaperi</i>				Other Printing and Writing Paper <i>Muu paino- ja kirjoituspaperi</i>			
	1973 –75	1980	1985	1990	1973 –75	1980	1985	1990
	Million tons							
Norh America	9.9	10.8–12.0	11.5–14.0	12.0–16.0	11.9	14.0–16.5	17.0–22.0	19.5–28.0
EEC	4.2	4.2– 4.9	4.7– 5.6	5.1– 7.0	7.8	9.9–10.7	11.5–12.5	13.0–18.0
Nordic Countries	0.4	0.5– 0.6	0.5– 0.7	0.6– 0.8	0.7	0.8– 0.9	0.9– 1.3	1.0– 1.6
Other Western Europe	0.8	0.9– 1.0	1.0– 1.5	1.2– 1.7	1.4	1.7– 1.9	2.0– 2.3	2.3– 3.4
Western Europa	5.4	5.7– 6.4	6.3– 7.4	7.0– 9.0	10.0	12.4–13.5	14.5–16.0	16.3–23.0
Japan	2.2	2.6– 2.8	3.2– 3.6	4.0– 4.6	2.7	3.7– 4.0	4.8– 6.0	6.0– 8.2
Oceania	0.6	0.6– 0.7	0.6– 0.8	0.7– 0.9	0.3	0.3– 0.5	0.5–0.65	0.75– 0.9
<b>Developed Regions</b>	18.0	20.0–21.7	22.0–25.5	24.0–30.0	24.8	30.6–34.0	37.0–44.5	43.0–60.0
Latin America	1.0	1.2– 1.4	1.4– 1.9	1.7– 2.5	1.2	1.7– 1.9	2.2– 2.6	3.2– 3.8
Near East (North Africa)	0.1	0.2– 0.3	0.25–0.35	0.35– 0.6	0.3	0.5– 0.65	0.8– 1.0	1.3– 1.9
Africa (South of Sahara)	0.2	0.25– 0.3	0.3– 0.4	0.35– 0.5	0.25	0.35– 0.4	0.4– 0.55	0.6– 0.9
Far East	0.7	0.8– 1.1	0.9–1.6	1.1– 2.0	1.2	1.4– 1.8	1.7– 2.5	2.3– 3.5
<b>Developing Regions</b>	2.1	2.5– 2.9	2.9– 4.0	3.6– 5.4	2.9	4.0– 4.7	5.2– 6.6	7.5–10.0
<b>Centrally Planned Economies</b>	2.5	3.1– 3.4	3.8– 4.2	4.6– 5.8	3.5	4.7– 5.4	5.9– 6.8	6.8– 9.5
<b>WORLD Total</b>	22.5	25.6–28.0	29.0–33.5	32.3–41.0	31.2	40.0–44.0	48.0–57.0	57.0–79.0



(Table 2 cont'd)

	Other Paper and Paperboard <i>Muu paperi ja kartonki</i>				Total Paper and Paperboard <i>Yhteensä</i>			
	1973 -75	1980	1985	1990	1973 -75	1980	1985	1990
	Million tons							
North America	36.1	42.5- 45.5	49.5- 53.0	57.5- 63.0	57.9	69.0- 72.0	80.0- 85.0	91.0-102.0
EEC	16.7	19.5- 21.0	22.0- 25.0	25.5- 30.0	28.6	34.0- 36.0	39.0- 43.0	45.0- 52.0
Nordic Countries	1.9	1.85- 2.3	2.0- 2.5	2.1- 3.0	3.1	3.2- 3.7	3.5- 4.2	3.8- 5.0
Other Western Europe	3.5	4.4- 5.0	5.4- 6.7	7.0- 8.6	5.6	7.5- 8.0	8.6- 10.0	11.0- 13.5
Western Europe	22.1	25.7- 28.3	30.0- 33.5	35.0- 40.0	37.4	45.0- 47.0	52.0- 56.0	60.0- 68.0
Japan	9.9	12.5- 13.5	16.0- 18.0	19.5- 22.0	14.8	19.0- 20.0	24.0- 27.0	30.0- 34.0
Oceania	1.3	1.5- 1.7	1.7- 2.2	2.0- 2.8	2.2	2.4- 2.9	3.0- 3.4	3.7- 4.2
Developed Regions	69.1	83.0- 88.0	98.0-105.0	115.0-125.0	112.2	136.0-141.0	160.0-175.0	185.0-210.0
Latin America	4.4	5.8- 6.8	7.4- 9.0	9.5- 12.5	6.6	8.7- 10.0	11.0- 13.5	14.5- 18.5
Near East (North Africa)	0.8	1.2- 1.5	1.8- 2.5	2.4- 3.2	1.3	1.9- 2.4	3.0- 3.8	4.1- 5.6
Africa (South of Sahara)	1.0	1.1- 1.2	1.3- 1.5	1.6- 2.0	1.4	1.7- 1.9	2.1- 2.4	2.6- 3.6
Far East	2.1	2.8- 3.3	3.7- 4.7	4.5- 7.0	4.0	5.0- 6.2	6.3- 8.8	8.0- 12.0
Developing Regions	8.3	11.0- 12.5	14.5- 17.0	19.0- 24.0	13.3	18.0- 20.0	23.0- 26.0	30.0- 38.0
Centrally Planned Economies	12.1	15.0- 18.0	19.0- 24.0	25.0- 35.0	18.1	23.5-26.5	30.0- 34.0	37.0- 46.0
WORLD Total	89.4	110.0-117.0	134.0-140.0	162.0-182.0	143.6	177.0-187.0	215.0-230.0	250.0-290.0

Source: Same as for Table 1.

- (9) In arid and semiarid areas, forestry may create the technical requirements for agriculture (cf. agroforestry). This is an important aspect in many developing countries where the area of arable land is too small in relation to rapidly increasing population.
- (10) Forests provide an important source of capital in rapid development programs. This has been the case, for example, in the United States, Canada, the Nordic Countries and Australia. The private forest industries provide an object for taxation and thus an indirect source of income for the government.
- (11) Forests provide many valuable services,

- such as recreation, hunting, tourism, erosion control and protection of watershed areas.
- (12) With the diminution of exhaustible natural resources, in particular of fossile fuels, and with their prices rising, forests become more significant. In developing countries, up to 90 per cent of wood consumption is accounted for by fuelwood. Its importance in households may continue for a long time.
- (13) The regional backwash effects of forestry and the timber economy (cf. p. 201) are smaller than those of most other industries because harvesting operations, silvicultural work, maintenance of ma-

chinery and the building of infrastructure are also required in remote rural areas.

The weight of these aspects varies with the circumstances in each country. They are by no means universal investment criteria. The profitability of an investment must be assessed separately in each case. Yet, taking into

consideration all the above-mentioned aspects, forestry is likely to rank rather high when determining the priority of what production should be increased, what demand should be fully satisfied, and what consumption should be limited. If the possibilities of forestry were to be fully utilized, it would no doubt be a considerable agent in speeding up development.

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## SELOSTE:

### METSÄ- JA PUUTALOUDEN VAIKUTUS TALOUDELLISEEN KEHITYKSEEN

Artikkelissa käsitellään taloudellisen kasvun erilaistumista eri maissa ja eri alueilla sekä syitä näihin eroihin. Investointien keskeinen asema taloudellisen kasvun tekijänä ja kasvun alueellisen erilaistumisen mekanismi todetaan. Metsä ja puutalouden investointien ominaisuuksia taloudellisen kasvun, sen alueellisen erilaistumisen tai tasoitumisen kannalta tarkastellaan. Alueellisen erilaistu-

misen teorioiden valossa pelkkä raaka-aineen tuottaminen jollakin alueella lisää alueellisia kehityseroja, jos tuo raaka-aine jalostetaan jollakin muulla alueella - siitä huolimatta, että tulotaso kohoaa kummallakin alueella. Niin ollen kehitysmaiden metsityshankkeiden ohella olisi kehitettävä metsäteollisuutta.