17 Linking Pollution and Macroeconomic Variables: An Indonesian Example

Iwan J. Azis

Increasingly, environmental issues have become an integral part of economic planning and decision-making in many countries. The consensus seems to suggest that the solution approach would be to internalize the externalities, since many of the environment-cum-economic issues involve problems of externalities. There seems to be little disputes about the need to apply monetary prices for environmental resources, for example, air, river water and so on, which, as often practised, have always been exploited without real monetary costs (market imperfection). Another case often found is the failure to assign some prices or costs on pollution, which is frequently considered a 'bad' outputs. Even if costs are incurred, more often than not these are far below the optimal level, creating a divergence between private and social returns.

Incorporating a pollution charge will imply, on the other hand, higher costs, which may also mean greater inefficiency for the economy. This applies to cases in which incorporating pollution into economic calculation is done either through a preventive act (for example, operating pollution-reducing equipment), or by incurring a special tax that corresponds to the pollution emitted. While some complications related to technological constraints may be involved in the first case, likely to increase the costs even further, the tax solution is often considered to be more practical and less costly. Even in a typical developing country with a considerable scale of (inefficient) administrative bureaucracy, taxing the polluters would still seem to be more feasible and has higher degree of effectiveness than imposing a certain standard on producing sectors across the board.

There remain, however, questions regarding the level of pollution that society can tolerate, based upon which the size of cleaning-up activities can be determined which may be financed at least partially by pollution taxes. There is then a question of who would be in charge of the pollution clean-up, private or public sectors? Policy-makers are also bound to determine the appropriate (optimal) pollution tax rate, based upon which the internal mechanism of the economy will generate maximum social welfare measured by some utility functions. But perhaps most important of all, along with increased awareness about environmental problems, policy-makers in many developing countries are often still in need of a more concrete understanding of the intricate mechanism connecting environmental factors with other standard macroeconomic indicators. This is often considered necessary before any policy can be implemented effectively.

The model presented in this chapter deals with some of these questions by capturing macroeconomic variables, but with the explicit topic of pollution tax. The country case study is Indonesia. The model is in the category of computable general equilibrium (CGE) and it is a modification from S. Robinson's stylist model (Robinson, 1990). Following the description of the model, a set of simulation results based on Indonesian data is exposed.

THE MODEL

In an economy-wide model with a pollution factor, it is quite natural to expect some modifications to be made in the standard utility function. There are various forms of utility function one could apply. Following Robinson (1990), we shall adopt a standard Stone–Geary function where the minima or subsistence parameters, g_i, are constant:

$$U = \prod_i (C_i - g_i)^{\beta i} = (TNP - NP)^{\beta m} \prod_k (C_k - g_k)^{\beta k} \quad (17.1)$$

There are two categories of sector in the economy: market goods (consisting of $h = 1, 2, \ldots, m - 1$) and non-market goods, that is, the pollution-cleaning activity (m). The consumption for cleaning is related to the minima g_m; in this case, it is defined as the difference between the amount of dirt and the level of emission society can tolerate. Thus, the cleaning activity is treated as goods which have prices or an economic value. If the consumption for cleaning (C_m) is assumed to be zero, that is, its market is missing, the left side of the utility expression, $(NP - TNP)^{\beta m}$, reflects the actual dirt after cleaning beyond the tolerable level of pollution, where β is the marginal expenditure coefficient. From this specification, any reduction in the pollution

will tend to pull the utility level downwards. The net effect, however, depends on the interplay of pollution reduction and the increased consumption of 'market goods', C_i.

The net pollution is simply the total emission minus whatever level of cleaning activity:

$$NP = \sum_i pc_i Q_i - G_m \quad (17.2)$$

From the utility maximization, a linear expenditure system (LES) is generated, which, in the tradition of standard CGE model becomes the equation representing the demand for the commodity market:

$$P_k C_k = P_k g_k + mc_k YPS \quad (17.3)$$

The income expression, *YPS*, is defined as incomes that are not committed to purchasing the minima. By convention, it is called the 'supernumerary income', the algebraic definition of which will be exposed later.

Viewed from the production side, the optimal solution in terms of pollution tax, the size of cleaning activity and the corresponding utility level, will all depend on the nature of the production function being adopted. In particular, variable elasticity of substitution (VES) between factor inputs is likely to generate different results in each sector, since the response of factor proportions to factor–price changes will not be the same inter-sectorally. The specific form of the VES function being used in the model is:

$$Q_i = A_i K_i^{(1-\delta\rho)} [L_i + (\rho - 1) K_i]^{\delta\rho} \quad (17.4)$$

where $\sigma(k) = 1 + [(\rho - 1)/(1 - \delta\rho)] \cdot k$; k being the capital–labour ratio, and $1/k > [(1 - \rho)/(1 - \delta\rho)]$; $0 < \delta < 1$; and $0 <= \delta\rho <= 1$[1]

The output price is specified in a straightforward manner:

$$\overline{P} = \prod_i P_i^{\beta i} \quad \text{set as numeraire} \quad (17.5)$$

where only the market sectors are counted in the cost of living index:

$$CPI = \prod_k P_k^{\beta k} \quad (17.6)$$

To generate the income equation we first need to have the value-added price:

$$PV_i = P_i - tn_iP_i - \sum_j A_{ji}P_j - t_i \tag{17.7}$$

Notice that in the above equation the pollution tax, t_i, is further subtracted from the net price.

The commodity market will be cleared on the basis of total demand being equal to total supply:

$$C_i + G_i + \sum_j A_{ij}Q_j = Q_i \tag{17.8}$$

In the factor market side, factor returns are simply derived from the first-order condition:

$$W_K = A_i(1 - \delta\rho)[(\rho - 1) + (L_i/K_i)]^{\delta\rho} + A_i\delta\rho(\rho - 1)[(\rho - 1)+ (L_i/K_i)]^{\delta\rho - 1} \tag{17.9}$$

$$W_L = A_i\delta\rho[(\rho - 1) + (L_i/K_i)]^{(\delta\rho - 1)} \tag{17.10}$$

and the market is cleared via the equalization of factor demand and factor supply, where the latter is assumed to be constant:

$$\sum_i L_i = \bar{L} \tag{17.11}$$

$$\sum_i K_i = \bar{K} \tag{17.12}$$

Given the value-added prices stated earlier, the private incomes are composed of two elements: incomes from production activities accrued to private sectors, and government transfers which, for simplicity, are assumed to be entirely channelled back to the consumers. There is no reason why we have to impose such a simplified assumption; but since it implies no loss of generalization, at this stage we shall maintain this assumption, for simplicity:

$$YP = \sum_i PV_iQ_i + GR - \sum_i P_iG_i \tag{17.13}$$

The algebraic definition of 'supernumerary income' is:

$$YPS = YP - \sum_k P_kg_k \tag{17.14}$$

which, as stated earlier, is the income not committed to purchasing the minima.

For the purpose of simulating various scenarios under which different levels of cleaning activity are proposed, government expenditure for this activity are set as the policy instrument (exogenously determined):

$$G_m = \overline{G_m} \tag{17.15}$$

One can easily modify the model by connecting this item with revenues from pollution tax or other forms of 'prices' attached to pollution externalities. It should be clear that, the more cleaning that is done, the greater the reduction in pollution will be, and consequently utility will increase.

On the revenue side, all proceeds from pollution tax are accrued to the government. Again, for simplicity, let us assume that no condition is imposed on the specific use of those revenues:

$$GR = \sum_i [t_iQ_i + tn_iP_i] \tag{17.16}$$

where

$$t_i = t_P \cdot pc_i \tag{17.17}$$

Below is a description of all the variables contained in the above model:

m = cleaning activity (non-market sector)
i = $1, 2, \ldots, m$
h = $1, 2, \ldots, m - 1$ (market sector)

NP = net pollution emission
pc = pollution coefficient per unit of output
Q = output level
G_m = cleaning activity
PV = net or value-added price
CPI = consumers' price (cost of living) index
P = producers' price
tn = indirect tax rate
t = sectoral tax on pollution
A = input–output coefficient
t_p = pollution tax per unit of emission
W_L = wages
W_k = capital return

U = utility
TNP = tolerable level of emission
C = final demand
g = minimum consumption (the minima)
GR = government revenues
YP = private incomes
YPS = private supernumerary incomes[2]
mc = private marginal cost (outside cleaning activity)
L = labour
K = capital
β = marginal expenditure share
ρ = coefficient of substitution
δ = distributive parameter.

The set of equations presented above only represents the basic model, but it is already capable of serving the main purpose of the analysis. Naturally, further refinements can and must be made if the model is to be applied in a real situation.

With the above specification, we simulate the model in two steps: first, no pollution tax is imposed, so that only government cleaning activity will determine the quality of the environment, and hence the utility level; second, pollution tax is imposed in addition to the cleaning activity. The hypothesis related to these two steps alludes to the superiority of imposing pollution tax as one form of internalizing the externalities, which often is the consensus on how to deal with environment-cum-economic issues. Furthermore, it is also expected that the model simulation will yield an optimal pollution tax that will be consistent with the utility maximization framework. Finally, to make use of the VES produc-tion function, we shall also attempt to compare results from several scenarios under different parameters of substitution implied in such a function.

DATA REQUIREMENT

A close connection between pollution emission as a by-product, the cleaning activity as one of the goods sectors, and the overall economic activities, ought to be represented in the data set that will be used in the model. It is .precisely for this reason that an input–output (IO) table becomes the logical candidate for the data set. The incorporation of intermediate inputs in matrix A also justifies the use of an IO framework. However, unlike in most IO applications, physical units are required in this model. One certainly cannot integrate the pollution emission into the IO table if the table contains only numbers in monetary units. Pollution, like the cleaning activity, is in the category of non-market sector, where no price is currently attached to it. In many countries we find this situation occurs relatively frequently; Indonesia is by no means an exception. It is, in fact, only through the model simulation we are led to argue that a certain price has to be imposed on environmental goods.

On the basis of data availability for pollution emission by sectors, the original sixty-six sectors of the 1985 Indonesian IO table are grouped into twelve sectors, plus one cleaning activity (sector number 13). The following is the list of those twelve sectors: 1. Paddy; 2. Other food crops; 3. Other agriculture; 4. Animal husbandry; 5. Forestry; 6. Fisheries; 7. Mining and quarrying; 8. Food industry; 9. Other industries; 10. Oil and gas refining; 11. Electricity, gas and water; 12. Other.

The next step was to obtain the average price level for each sector. Since no price data for aggregate sectors are available, we had to work with disaggregate data. For this purpose, a concordance of sectoral codes or classifications needed to be constructed. In the case of the non-manufacturing sector, we used the weighted average of a three-digit-based IO classification to yield an average price for a one-digit sector. For the manufacturing sector, a concordance of a three-digit IO with a five-digit ISIC was first carried out before a weighted average of unit price was generated. Unfortunately, not all industries can be treated in this way, either because of non-uniformity in the unit of production being recorded, for example, carpets (sectoral code 080) and cosmetics (098), or simply because no price data are available, for example, medicines (097), traditional medicines (100), coal-related manufacture (103); and aircraft industry (131). Consequently, these industries have to be grouped into the two-digit IO classification.

At this stage, the type of pollution being examined is confined to the CO_2 emission, the data being obtained from sources available at the Ministry of Environment and Population. Whenever data on sectoral pollution were suspected of being unreliable, a method known as the 'analytic hierarchy process' (AHP) was adopted to reveal the experts' perception. This approach was also applied to inspecting the reliability of data on the production of the cleaning activity. It is important to note that, eventually, the required information on sectoral pollution was measured in terms of per-unit output emission ('dirt-coefficient'), suggesting that obtaining data on absolute amounts of pollution is necessary.

RESULTS OF MODEL SIMULATION

One of the policy questions often posed concerns the issue of the trade-off between economic development and environmental considerations. Conventional macroeconomists would tend to confirm the presence of the trade-off, especially when economic growth is to be contrasted with policies to protect the environment. However, there are more and more people who now believe that the two should not be in conflict. Indeed, the message of the UN Rio Conference in 1992 was, among other things, to suggest a development path in which efforts to protect the environment would not be in conflict with economic development. The proposed concept, 'sustainable development', recommends basically that economic development and the environment should go hand-in-hand, rather than to operating separately.

While it is certainly an attractive conjecture, the difficulties involved in its application are enormous. In the context of the model presented here, we shall examine various scenarios with respect to the size of cleaning activity and the imposition of pollution tax, through which the nature of trade-off can be analyzed. Given the fact that GDP is perhaps the most often used indicator to measure economic growth, it will first be defined in the model:

$$GDP = \sum_{i} (C_i + G_i) \qquad (17.18)$$

Another indicator worth comparing is the extent of government net revenues when environmental considerations are taken into account in the undertaking of macroeconomic policies, that is, imposing a pollution tax and conducting cleaning activities. This can be retrieved from the difference between revenues accrued from pollution tax and the monetary costs of cleaning (recall that in this version we assume that all cleaning is done by the government):

$$NPREV = t_i Q_i - P_m G_m \qquad (17.19)$$

where NPREV is the net pollution revenue.

Given the model specification, several types of simulation can be generated, the choice of which will depend on the questions at hand. Two types of simulation presented here will take government cleaning, G_m, as the policy variable.[3] The size of this government demand for cleaning will have ramifications for various macroeconomic variables, including the endogenously determined pollution tax appearing in the model, and at the same time it will directly determine environmental quality (net emission, *NP*). In this respect, the connection between development path and environmental quality can be captured. Hence, the non-linear optimization problems involves two decision variables: government cleaning, G_m and pollution tax (t_i and t_p). The solution to such a problem is a market equilibrium which maximizes social welfare.

The first experiment assumes that no pollution tax is imposed. In other words, the ultimate level of environmental quality will depend only upon how much pollution is emitted by production sectors and how much cleaning has been done by the government. Table A.1 displays the results of simulation at various levels of government cleaning, ranging from 980 to 1100 units. With this setting, it is clear that 1055 unit of cleaning gives the highest utility level, and hence this is considered the optimal level (see Appendix, pp. 359–63, for Tables A.1–4.)

Notice that the rejoinder to the issue of trade-off will depend on the range of G_m as well as the choice of variable being used. More specifically, when we use *GDP* as the indicator of economic growth, at any G_m below the optimal level, no sign of trade-off is observed; the improved environmental quality measured by declining net dirt gives a persistent increase, not only in utility but also in the values of real GDP. This pattern remains even when the level of real consumption steadily declines. Obviously, this is explained by the fact that the increased output of cleaning has more than offset the decline in consumption of market goods. At the same time, consumption patterns have also changed. As some sectors suffer from a decreasing price, the demand for these goods have increased, for example, in 'Other' (sector number 12), or, vice versa, when the price increases, consumption tends to decline, for example, 'Other food crops' (number 2) and 'Oil and gas refining' (number 10).

The presence of trade-off is detected beyond the optimum level of cleaning. While the environmental condition improves as the government spends more on cleaning activities (from 1055 to 1100 units); the GDP and consumption levels decline steadily.

The second experiment imposes pollution tax on the problem, such that the obtained solution will be the first-best welfare maximum, that is, at $G_m = 995$ and $t_p = 35086.9$ as observed from Table A.2 with the same level of cleaning as in the preceding experiment, a higher utility level is achieved if pollution tax is imposed. At the benchmark value of cleaning ($G_m = 1055$), the utility is 1.6 per cent higher than in the previous case. Intuitively, this is supported by a quite straightforward interpretation: the amount of pollution is reduced by two forces, government cleaning and increased costs of pollution via a pollution tax imposed on polluters. Eventually, this will lead to a more pronounced change in the structure of production and consumption.

Take, for example, the 'Forestry' sector (number 5). In the series of nine experiments, the pollution tax per unit of forestry output is steadily increasing along with the increased cleaning activity. As shown in Table A.2, this induced a persistent increase in the product price of the respective sector from 17371.8 in Experiment 1 to 17373.7 in Experiment 9. This could be the case where producers transfer the burden of pollution tax to consumers, a practice often adopted by producers in order to maintain their profit level. Consequently, the consumption share of this sector declines, although only slightly, from 0.0913 to 0.0912 per cent. A similar case, with a sharper decline, occurs in the 'Mining and quarrying' sector (number 7), that is, from 1.2832 to 1.2826 per cent.

At any rate, one can see immediately the power of pollution tax to affect environmental condition as well as other economic variables in the economy. At the bench-mark value of cleaning, for example, the net dirt shown in Table A.2 is less than half of the level in the case of no pollution tax seen in Table A.1 (52.5 compared to 117.1). Furthermore, at lower levels of cleaning, the pollution tax tends to have a higher net impact on pollution generation. From Experiment 1 to Experiment 2 the marginal net dirt of pollution tax is 6.3951, whereas from Experiment 8 to Experiment 9 the marginal net dirt is 6.3766. If further experiments with greater levels of cleaning are conducted, the gap will probably widen.

At the market equilibrium and welfare maximizing point (G_m = 995 and utility = 679.6115) the optimal pollution tax per unit of emission is 35086.9. Beyond that level, even if the government intends to increase cleaning activities that will lead to a further decline in net dirt, the utility level will steadily *decrease*. This indicates that within such a range the results are second-best welfare maxima, with pollution tax being optimal, given non-optimal values of G_m. Such a pattern is prompted by the level of pollution tax that is considered too burdensome. Indeed, pollution tax steadily increased up to Experiment 7, although in the last two experiments a different pattern was detected.

From the model mechanism, the implicit price elasticities of demand induced optimal pollution tax per unit of output at the maximum welfare solution that varies widely from a low 70.2 for 'Animal husbandry' (sector number 4) to a high 10526.1 for 'Oil and gas refining' (number 10). Obviously, such results are also affected by the pollution coefficients specified in the baseline table.

As indicated earlier, the specification of variable elasticity of substitution (VES) in the production function allows us to set different degrees of input substitution in each sector. Results of running the model at a same level of optimal G_m, 995 unit, but with different substitution parameters in each sector (see Table A.3) are listed in Table A.4.

Notice that Scenario A is basically adopting a Cobb–Douglas function, whereas Scenarios B and F use CES function. The other scenarios presumably reflect more realistic situations and specify the variable elasticity of the substitution function inter-sectorally. As shown in Table A.4, the optimal utility level is different in each scenerio, but the optimal level of G_m remains the same, that is, 995 units.

Let us take the comparison between Scenario A and Scenario E. In Scenario E, there are six sectors (including the cleaning sector) assumed to have a greater ease of substitution between the two inputs. These sectors are, in general, labour-intensive categories. On the other hand, there are seven sectors that have elasticity of substitution lower than unity, implying less flexibility in adapting their technology (these are mostly capital-intensive sectors).

It is observed from Table A.4 that at the optimal level, Scenario E generates a higher utility level but a slightly lower GDP and consumption level than in Scenario A. Such results can be traced from changes in sectoral prices. As the rate of pollution tax per unit of emission (t_p) becomes higher, raising the sectoral pollution tax per unit of output (t_i), the output price of many sectors will increase. In fact, in this particular case, the price increased in seven sectors, and it is expected that this will transform into a reduction in the consumption level. Since the consumption share of these sectors already covered as much as 86 per cent of total consumption, we can expect there will be a decline in total consumption. This is indeed the case.

How do we explain the lower utility in Scenario E? Notice that the net emission (*NP*) is higher in this scenario. Therefore, given the specification of utility function in Equation 17.1, one can observe that despite the lower consumption of 'market goods', C_h, the higher *NP* have more than offset such a reduction, bringing about a higher utility level. Obviously, we cannot generalize from this situation. The net effect of pull and push forces coming from these two components will vary case by case.

In the government sector, total revenues accrued from pollution tax amount to Rp 38.9 billion, which is slightly higher than the pollution tax revenues under Scenario A. Furthermore, the obtained price of the cleaning activity is found to be lower. Therefore the net pollution revenue (*NPREV*) is higher in Scenario E.

Some generalization, however, can still be addressed, for example, when we compare the case of the Cobb–Douglas function and the lower-than-unity elasticity of substitution (CES) function (comparing Scenarios A and B). Similar to the previous case, output level in Scenario B is higher. With constant pc_i, this implies a greater emission (*NP*). Furthermore, pollution tax is also lower, inducing a price decline and consumption increase in many sectors. It turns out that those sectors experiencing a price decline (numbers 1, 2, 3, 8, 9, 10 and 11) represent more than 84 per cent of total consumption. Therefore, eventually, overall consumption will increase, and so will GDP (see again Table A.4).

The greater magnitude of *NP* has pulled the utility level downwards significantly. Consequently, although consumption of 'market goods' has increased, this appears to be insufficient to avert the utility reduction. Unlike in the previous case, the price unit of the cleaning activity is now lower than the level under Scenario A. Unfortunately, however, the reduction in pollution tax revenues is even greater. In effect, as we observe from Table A.4, the net pollution revenue (*NPREV*) is lower than in Scenario A. Results from Scenario F, when compared with Scenario A, imply the opposite of those found in the previous comparison between Scenario A and Scenario B. Scenarios C and D are basically variations of the other scenarios.

Therefore, it is clear that the adoption of the VES function provides more flexibility during analysis. When more accurate and reliable data on elasticity of substitution (σ) for each sector are available, the necessary adjustment can be made directly; $\sigma = 1$ and $\sigma =$ constant across sectors are obviously special cases of the VES function.

CONCLUSIONS

The CGE framework presented in this chapter is a modification of Robinson's model on the interconnection between environmental and economic variables. More specifically, the model is designed to demonstrate the nexus between pollution, market failure and optimal policy in an economy-wide framework. The optimality in this case alludes to the maximum utility that is jointly determined by the consumption of conventional 'market' goods and that of pollution-related environmental quality. Unlike Robinson's model, the one presented here assumes neither equal factor returns nor identical elasticity of substitution between sectors. In this respect, more flexibility is gained.

From the application to the Indonesian case, it is demonstrated that, under different levels of cleaning, the standard macro aggregates and pollution variables can be determined simultaneously through endogenous price setting. The superiority of a pollution tax in affecting the condition of the environment and other economic variables is shown by comparing the simulation results from the scenario *with* and *without* imposing this tax. The use of this model is also capable of unravelling the nature of trade-off between growth and environment that is often addressed.

Obviously, numerous refinements should be made before the model can be applied in real cases. Extension of the model to conceal income and other forms of transfer payments between different income groups will enrich the analysis, since in reality different income groups are likely to perceive differently the importance of environmental quality *vis-à-vis* consumption of conventional goods. In this respect, the utilization of a social accounting matrix (SAM), rather than a standard input–output framework along with a more elaborate utility function is certainly desirable. The explicit treatment of different types of pollution will also make the analysis more complete. Nothwithstanding these points, however, as it stands now the model is already capable of serving the main purpose of the analysis.

Notes

1. The derivation of the functions is shown in Iwan J. Azis (1985) *Elements of Interregional Interaction* (Jakarta: PT Pembimbing Masa) pp. 79–82.
2. Not all incomes are spent on minimum consumption; the unspent part is called supernumerary income.
3. Obviously, cleaning is only one of many activities on which the government will spend its budget. However, to concentrate on the issue of controlling pollution emission, without a loss of generality, at this stage we shall temporarily restrict the analysis of government expenditure to only the cleaning activities.

References

Azis, I. J. (1994) 'Internalization of Externalities: An Environment CGE Model for Indonesia', in A. Anwar, T. K. Wie and I. J. Azis (eds), *The Thought, Implementation and Pioneering Work of Economic Development* (Jakarta: Gramedia) (in Indonesian).

Azis, I. J. (1981) *Elements of Interregional Interaction* (Jakarta: PT Pembimbing Masa).
Robinson, S. (1991) *Pollution Failure and Optimal Policy in an Economywide Framework*, Working Paper No. 559, Department of Agricultural and Resource Economics, University of California at Berkeley.
Saaty, T. L. (1991) *Multicriteria Decision Making, The Analytic Hierarchy Process: Planning, Priority Setting, Resource Allocation* (2nd edn) (Pittsburgh, Penn.: RWS Publications).

18 Urban Planning in the Modern Middle East

Hooshang Amirahmadi

Urban planning has a long history in the Middle East. Melville Branch (1981, p. 13) dates the first 'city plan', for Catal Huyuk, present-day Turkey, back to 8000 years ago. He bases this claim on the ordering and placement of eighty dwellings, which were delineated on the wall of a cave. Examples of city planning from both ancient and the Middle Ages periods abound in Iran, Egypt and Mesopotamia (present Iraq), among other Middle Eastern countries. This chapter, however, provides an overview of urban planning in the modern Middle East. There have been two major influences on contemporary urban planning in this region: colonialism and petroleum.

This chapter, in three sections, will show how these two influences, among other factors, have shaped the contemporary Middle Eastern urban landscape. The first section deals with the colonial period (circa 1800–1940s), while the second section focuses on the period of transition between the colonial period and the oil boom era (1940s–early 1970s). The final section traces the major issues in urban planning from the oil boom era (post-1972) to the present (1990s).

Within these three periods, urban planning has seen a shift in its emphasis from being a profession primarily involved in physical planning and urban design, to its present stage of integrating socioeconomic and physical planning. In particular, the colonial period was dominated by the use of physical planning. In the period of transition, attempts were made to include economic, social and demographic factors in urban planning. On the whole, however, planning remained in the shadow of independence politics. Finally, at the present stage, the concept of integrating physical and socioeconomic planning is commonplace, though not always successful. Most recent trends suggest the increasing emphasis of urban planners on anticipatory/preventive approach into the twenty-first century.