Policy Implications of Research on Energy Intake and Activity Levels with Reference to the Debate of the Energy Adequacy of Existing Diets in Developing Countries

Shlomo Reutlinger
May 1983

The views presented here are those of the authors, and they should not be interpreted as reflecting those of the World Bank.
This paper was prepared for the Conference on Protein Energy Intake and Activity Levels, Rockefeller Study at Conference Center, Bellagio, Italy, May 2-7, 1983.
I. INTRODUCTION

In essence, the central policy question is whether the average energy intake of sub-populations known to have low intakes should be augmented through public intervention. Ideally, that is, we want to know the benefits and the costs from such interventions.

As a practical matter, the public policy debate about nutrition has proceeded on another plane. We have all accepted too readily the notion of an energy "requirement" level which should be met by all persons (or more correctly, the average person) of the same sex, age and body size, in all places and at all times. I think we all knew better, but went along because it was convenient. Convenience and pragmatism are important, but perhaps we can do a little better, if first we admit openly that all is not well and then proceed to open the black box.

Aside from convenience, the present state of affairs, I believe, is also the result of insufficient communication between nutritionists, economists and policy-makers. Nutritionists can and do make estimates of energy "requirements" for achieving very particular results—rates of growth in children, activity levels, etc. They cannot and did not tell us what results "should be" achieved. Economists and policy-makers also do not know, not having even approximate ideas on how body weight and activity levels affect economic performance and not having any theory about what should be the income distribution or what is an acceptable level of poverty. We simply wanted to believe that nutritionists have the answer to what is the "basic need." We didn't try to really understand what nutritionists were saying and nutritionists enjoyed perhaps a little too much being in the limelight which knowing the answer to a perplexing question begets.
The recent flurry of interest among policy-makers and advisors for more solid information about benefits and costs of augmenting low energy diets, of which this meeting is one manifestation, has in my view several origins.

Attempts in recent years by economists and statisticians (Dandeker and Rath, 1971; Reutlinger and Selowsky, 1976; Reutlinger and Alderman, 1980; FAO, 1977) to draw out the implications of using the energy requirement standards advocated by the FAO/WHO Expert Committee or similar standards for estimating the size of the population in developing countries not meeting such requirements have provided a vivid illustration of the potential magnitude of the problem if such standards are to be met. These same studies also drew attention to the variation in energy intakes among different socio-economic groups of people and therefore also raised questions about the validity of using country average standards for all segments of the population. Since the financial, administrative and political costs of augmenting the food energy intakes of all people to the level of the FAO/WHO requirement standards are known to be very high, some basic questions are now being asked, correctly in my view, about the nature of the recommended requirements and whether they could be stated more precisely in reference to particular socio-economic groups. What are the consequences of lower than the recommended intakes - for children and adults? for people exposed to more or less risk of infectious diseases? for people accustomed to different activity patterns? for people expected to participate in economic change?
Another reason why we see, or should see, a lot of interest in the relative benefits of augmenting food energy intakes is the growing realization that the marginal cost of augmenting energy intakes through monetary assistance to a household rises sharply with the existing level of intake. In other words, it may require two or three times as large an income transfer in money or in kind to induce a household to increase the energy intake by a given amount if the initial per capita daily energy intake is 1,900 calories rather than 1,500 calories.

Yet another reason for the disenchantment with the use of the energy requirement concept is the growing debate among nutritionists over what is the "correct" level of requirements. It is becoming increasingly evident that the widely different recommendations suggested by different authorities are not due to different opinions about the medical and scientific interpretations of energy input/output relationships, though there may be some of that, but reflect normative judgments about lifestyles and the way other people should live and function. If this perception is correct, policy-makers and their advisors will quickly have to realize, though they might not wish to acknowledge it, that they cannot simply defer to the nutritionist for his authoritative judgment. For an excellent exposition of this point of view, see Beaton (1982).

Finally, as international aid resources and funding for government programs have become more scarce due to the slowdown in economic growth and rising debt levels, it is becoming increasingly necessary to cut down on food interventions which in the past were simply carried out for good political reasons and policy advisors are increasingly asked about the nature and
magnitude of the consequences of reducing already established interventions. The case of Sri Lanka is a good example of this. Sri Lanka has had a food rationing program in effect for over 35 years. The rice rationing program has supplied 2-4 lbs. per capita per week, 1-2 lbs. of which was free with the remainder being subsidized. The coverage of this program has been nearly universal, primarily because the political cost of universal coverage was much less than the political cost of targeted coverage. But it is estimated that the economic cost of this program has amounted to 20% of current expenditures for the last 15 years (Isenman, 1980). And it is the economic costs of these programs that have recently encouraged Sri Lanka to begin scaling them back and targeting them.

In principle, for those of us accustomed to think like economists do, this shift in focus of attention from debating the appropriate "requirement of energy" to "what are the costs and benefits of different levels of energy" is a long overdue, welcome development. As a practical matter, we all enjoyed the convenience of using the notion of a fixed level of "energy requirements" against which international nutritional adequacy and related policy performance can be measured. What I believe is called for at this juncture is a reasonable compromise between what is the correct approach on theoretical grounds and what is an attainable, desirable and workable approach. We should stop debating what is the correct energy requirement of a population. If we have learned anything from studies of energy input/output relationships and benefit-cost calculations, it is that there is no such thing as a unique requirement level. On the other hand, since it would be enormously expensive and utterly impractical to carry out all the
studies and calculations needed to calculate optimal energy intakes for each specific population, it will remain necessary to measure up energy intake performance against some "requirement" standards. Not one standard, but an array of "requirement" levels, which each in turn, reflect levels of adequacy for different objectives.

In such a context, I am frankly quite skeptical about the policy implications of measuring precisely the relationship between the energy intake in particular individuals and their activity levels. My skepticism arises from my understanding of the nature of policy interventions and the dynamic nature of the environment in which individuals operate. Yet, some research designed to identify the entire activity profile of households at different levels of energy intake and carefully constructed experiments to identify circumstances in which energy sets undue constraints on activity could be quite instructive.

For the remainder of the paper, I will discuss the kinds of knowledge and judgments needed to evaluate policy options in regards to interventions aimed at satisfying food energy requirements of the population.

---

1/ In this respect, see Keys, et. al., 1950; Muller-Schwarze, Stagge, and Muller-Schwarze, 1982; Apfelbaum, Bostsarron, and Locatis, 1971; Batliwala, 1982; and INCAP, 1978; among others.
II. THE THEORY OF OPTIMAL ENERGY INTAKE

Whether we are considering individual household units or society at large, the basic considerations are the same; benefits and costs of energy intake differ for different levels of intake. What distinguishes household and societal decisions is the nature and magnitude of the benefits and costs relevant for their respective decisions. We shall refer to the nature and magnitude of the respective decisions many times, subsequently.

Figure 1 illustrates the marginal benefit and cost functions for different levels of energy intake. The optimal amount of energy intake is obviously at the point at which the marginal benefit equals the marginal cost. At issue are the shape of those marginal benefit and cost functions and how decisions can be made in the presence of a great deal of ignorance about these functions.

Let's first consider the individual household and see why the shape of the functions is as I have drawn them. Unless there is a certain minimum level of energy intake, there is no life; so one cannot speak in this range of the benefit of an additional unit of energy - the function does not exist. But once, there is enough energy to survive, additional units of energy are likely to have large benefits - in satisfying hunger, preventing diseases, performing more work, performing more household chores, etc. As the energy intake level increases, benefits on the initial accounts will decline and energy will be allocated to other ends with less marginal benefits, such as play, education and social interaction. There is much evidence to support this point. In a 1982 study by Muller-Schwarze, et. al.,
FIGURE 1: MARGINAL BENEFIT AND COST FUNCTIONS FOR ENERGY INTAKE OF HOUSEHOLDS

Marginal Benefit

Marginal Cost: Low Income

Marginal Cost: High Income

Cost Per Unit Of Energy

Optimal Level (Low Income) Optimal Level (High Income)

ENERGY INTAKE
fawns were subjected to an experimentally induced milk shortage. The fawns compensated by reducing play, and foraging more. It is reasonable to expect that the opposite would have been true had milk intake then increased. In several studies Viteri found that increased energy intake resulted in greater energy expenditure both at work and after work, especially when the individual was more severely malnourished. Marginally malnourished workers tended to use the extra energy intake on after work activities rather than on increasing their work productivity (Viteri, 1975; Viteri et al., 1981; Immink and Viteri, 1981; Immink, Viteri, and Helms, 1982).

On the cost side, rising marginal costs are the result of an overall budget constraint. More food means doing with less clothing, housing, etc. Just as there are diminishing benefits to more food energy, the cost of giving up more and more of the other amenities rises as levels of their consumption decreases. In very high income households, the sacrifice of other consumption items is miniscule as expenditures for energy intake increases and the marginal cost is approximately constant at whatever it costs to purchase a unit of energy.

There are many ways in which society can and does influence the shape of the marginal benefit and cost function - through the prices of everything in the consumption basket, the income attained by the household, the values of the uses made possible by the energy intake and the provision of information about the benefits of additional energy utilization. But in the final analysis, it is the physiological needs and psychological preferences and the values attached to the relative welfare of the members of the household which determine the right level of energy intake and its allocation to different uses and how much each member of the household gets.
Keeping in mind the determinants of individual household's decisions about food consumption and allocation is important for several reasons. First, it illustrates why it might be very difficult for public policy to influence selective uses of energy for purposes which the outsiders deem important. Secondly, it suggests which policies and interventions might be most suitable for achieving social objectives. For instance, measures which conserve energy in household chores might not lead to the allocation of much more energy to work related activities. The household might choose to decrease energy intake and allocate more energy to other uses. In contrast, more incentives to work related activities might have a much larger effect in that direction, if this is the primary objective. It might induce the household to increase energy intake and to allocate a larger share to work related activities. Finally, knowledge of how different groups of households utilize energy is important for targeting interventions selectively to achieve specific policy goals.

The theoretical framework for public decisions about augmenting energy intake is analogous to the one appropriate for private decisions. But the nature and magnitude of relevant benefits and costs might be quite different.

Society may count as a benefit only energy uses which increase overall productivity. When there is a great deal of unemployment, additional work related activity by underachieving households may benefit those households, but may not increase the gross national product. Increased activity by the underachieving households would then have to be regarded as a benefit only by a government concerned with a more egalitarian income
distribution. Such a government may also count it as a benefit if the additional energy is used to improve the quality of life. A government which provides free health services may count it as a benefit if energy is needed to reduce the demand on these facilities.

On the cost side, rising marginal cost for inducing more food consumption is the result not only of the overall constraints set by the government budget. The marginal cost of achieving higher levels of consumption rises also because it takes ever increasing amounts of income transfers in money or in kind to induce households to increase energy intake as their level of energy intake increases.²/

Figure 2 illustrates the levels of optimal energy intake under different public policy scenarios and country scenarios, characterized by respective marginal benefit and cost functions.

²/ Again the case of Sri Lanka is instructive in this regard; see Isenman, 1980.
FIGURE 2: MARGINAL BENEFIT AND COST OF PUBLIC REGULATION OF HOUSEHOLD ENERGY INTAKE

Marginal Benefit:
- Liberal Government

Marginal Cost:
- Poor Country

Marginal Benefit:
- Conservative Government

Marginal Cost:
- Rich Country

ENERGY INTAKE
III. SOME THOUGHTS ABOUT THE NATURE OF BENEFITS AND COST OF PUBLIC POLICY INTERVENTION

In this section, I will try to make just a few comments on benefits and costs and how these link up with the topic of this workshop.

(a) The Energy Intake of Individuals and Its Allocation to a Specific Use (Activity) Cannot Be Controlled

Except when a government undertakes the feeding of individuals (children or workers) throughout the day, the energy intake of individuals cannot be controlled. The unit of intervention is usually the household. Moreover, any augmentation of individuals' energy intake would likely have to be far in excess of the requirements for particular "outputs" deemed important for the pursuit of narrow policy objectives.

The observation that much of the augmented energy intake in low energy intake households is utilized for other than work related activities is easily documentable. Observed differences in energy intakes of households with different incomes are much larger than anything "explainable" on the basis of differences in energy requirements to support the additional income generating activities. How else can one explain the observation in many household surveys that daily energy intakes of adjacent income groups, particularly at the lower end of the income scale, differ by as much as 300 or 400 calories per capita or by 1,500 to 2,000 calories per household? The additional work performed could have required at best 300 to 400 calories. The members of the higher income groups usually have higher body weights and this can account for another 400 to 800 calories. By sheer deduction, the
remaining differences in intake must have been utilized in non-work related activities.\(^3\)

The way energy is utilized in the household has, in my view, two implications for the relevance of research on the relationship between activity and energy intake.

Research which deals with the energy requirements of only work related activities is of little use. Even if we were interested exclusively in providing for the energy needed in the performance of work tasks, how useful is it to know whether its performance requires 300 to 500 calories when we do not know whether the household needs 1,000 or 2,000 or more calories in order to allocate the additional necessary energy to the activity in question?

More relevant, in my view, would be studies which show the relationship between household energy intake and, say, the number of hours the income producing members of the household engage in energy intensive use activities. Such studies can give meaningful results, of course, only when demand for the various activities is the same for all the observed

\(^3\) In this context, it is also interesting to note that the transition from very low income to higher incomes, particularly in rural areas, may also reduce the energy required for work, particularly as energy use intensive activities such as walking long distances to fetch water and gather firewood are replaced with more convenient arrangements (Batliwala, 1982). Thus the net energy expenditures on work related activity and for the "basic life's chores" may not increase or may even decline as income and energy intakes are observed to increase.
households. We might for instance observe then that 2,000 incremental calories consumed by the household have the effect of the income producing members spending two additional hours at work. When the marginal energy cost is less than the value of two hours of work, the policy implication would be straightforward. A "pump priming" income transfer or other intervention to augment the household's energy intake would be highly rewarding.

While I would like to think that there are many opportunities for "pump priming" interventions, the little evidence we have so far, particularly from the studies conducted at INCAP (Viteri, 1975; Viteri et al., 1981; Immink and Viteri, 1981; and Immink, Viteri and Helms, 1982) suggests unfortunately that this is not the case. The opportunities for remunerative physical work usually does not seem to expand as rapidly as the labor force. Moreover, even households with low energy intake must and do give highest priority to the energy needed for sheer survival. Nevertheless, because "pump priming" interventions, if possible, would be so cost-effective, we should devote some more research to identifying appropriate opportunities.

The other implication of the observation that augmented energy intakes by households have joint, multiple "products" is that we must make sure that policy-makers should be made more aware of the potential benefits from enhanced energy availability for other than physical work related activities. Larger body sizes and activity seemingly unrelated to direct work output - such as children and adults exploring and interacting with the environment may in the long run have more development and income distribution benefits than augmented energy expenditure in the performance of physical work.
Recognizing and quantifying these non-direct work related energy uses might be particularly important, when there is much under- and unemployment and therefore little justification on immediate, direct productivity grounds to augment the energy intake of the poorest segments of the population.

While there is probably little disagreement with the contention that non-work related activity could have major long-run consequences, it is questionable whether these can be quantified to the extent necessary for making policy recommendations. On this question, I can only offer two quick comments here.

Even if we cannot predict, say, the development impact of a more socially active and interacting population, it would be a large step forward to know the energy expenditure profiles of households with different energy intakes and the extent to which these affect functional performance, such as educational achievements, the adoption of innovation, migration, etc. Since the development impact of enhanced energy intakes is in many ways the result of a long chain of events evolving over a long period of time, the only hope for unravelling the puzzle is to study separately links which can be observed at a single point in time. For the research to bear fruit in the policy context, it is important, however, that we are then mindful of the need to study all the links in the chain of events explaining the relationship between energy intake and development and that within a reasonable time the links are put together.
My other comment is that policy-makers should be warned against basing decisions exclusively on the more easily observable and measurable immediate benefits, when in fact there are other benefits, alas of a very uncertain nature. The benefits, say, of providing increased interaction between a child and his parents and siblings may be anywhere between zero or close to zero and very high. The expected benefits of the probability distribution of possible outcomes is then certainly not zero.

(b) The High Cost of Public Intervention to Increase Households' Energy Intake

While perhaps a good case could be made for there being substantial benefits in terms of development from fairly high levels of energy intake, perhaps on the order of the levels corresponding with moderate activity, we should not be misled to conclude that public intervention should increase energy intakes to such high levels. That decision requires also knowledge about the marginal cost function.

It is useful to think about the cost of public intervention on behalf of augmenting energy intakes of certain households as being affected by (i) the opportunity cost of public revenue; (ii) the cost of inducing households to increase their energy intake; (iii) the cost of administering the intervention. On at least the first two accounts, the marginal cost can be expected to increase sharply as governments aim to satisfy higher energy intake levels for the population. Why?
Let's first consider the cost of inducing households to increase energy intake. The most straightforward public intervention could take the form of transfer payments to augment the incomes of low income households. In this case, one dollar of transfer payments leads in the first instance to a dollar of additional income available in the low income household. Other public intervention programs, such as subsidized employment schemes or the transfer of subsidized food rations work precisely the same way, except that a dollar's worth of the program dollars may lead to less or more than a dollar of additional income in the recipient households. In our context, the central determinant of the induced change in energy intake is the household's allocation of the dollar received from the public intervention program between more energy intake and other needs, as seen by the household.

Figure 3 shows the relative marginal change in income associated with one unit increase in energy intake for households observed at different levels of energy intake in six separate household surveys. The interpretation is straightforward. If households allocate only an increasingly smaller share of additional income to the augmentation of their energy intake when their per capita intake level rises, the marginal cost of inducing energy augmentation through public intervention rises sharply as higher levels of intake are sought.
FIGURE 3:
INDICES OF MARGINAL COST PER CALORIE *

* The semi-log regression equations relating calorie intake to income, and the data sources used in deriving the marginal cost functions in Figure 3 are taken from Knudsen and Scandizzo, 1979. The marginal cost per calorie is the inverse of the marginal propensity to increase energy intake as income rises.
As an illustration, let's think of a nation in which 5 million people have daily energy intakes of 1,500 calories (on average), 15 million of 1,600 calories, 20 million of 1,700 calories and the remainder of 1,800 calories and more. Let's further assume that the additional (annual) income required to increase daily energy intake by 100 calories is $10, $15 and $25, respectively, at the level of intake of 1,500, 1,600 and 1,700 calories.

If the goal of the public intervention is to assure the entire population a minimum energy intake of 1,600 calories, 5 million people at very low levels of intake would have to get a total cash transfer of 50 million dollars. If the goal were to assure a minimum of 1,700 calories in the population, an additional 15 dollars per capita would have to be provided to the same 5 million people as well as to 15 million more people. The additional cost would be 300 million dollars. If a minimum energy intake of 1,800 calories were to be assured, the additional cost would be 1,000 million dollars. Thus the marginal cost of augmenting minimum energy intakes from 1,700 to 1,800 calories is 20 times the marginal cost of augmenting minimum intakes from 1,500 to 1,600 calories.

The above calculations are illustrative, but not unrealistic for what we know about the declining marginal propensities of households to allocate additional income to energy intake at different levels of energy intake (and income). The marginal cost of public intervention to increase the energy intake in the population rises sharply as higher levels of intake are sought, though the marginal cost curve may shift to the right or the left depending on whether a program dollar will deliver more or less than a dollar of income to the target population. If the public intervention takes on the form of subsidized employment, the cost would be reduced by the extent on
which the employment produces positive revenues. Similarly, if instead of money a food which costs less to the government than what it is worth to the recipients is distributed, the marginal cost curve would be to the left of what it would be if cash is distributed. In the not unlikely case of the government distributing a food which costs more to it than what it is worth to the recipients, the marginal cost curve is shifted to the right.

Clearly, the marginal cost function will be even more steep if we appropriately ascribe rising marginal costs to a dollar used for energy augmentation as the size of the program increases. In the case of fixed government revenues, a large nutrition program would reduce other high priority public expenditures, whereas a small program could be carried out by just cutting out some "fat" in other public programs. Similarly, taxes can be expected to have rising marginal costs as these increasingly reduce the incentive to produce and to save.

It is less clear what would happen to the marginal cost of administering public intervention programs and to political costs as increasing levels of energy augmentation are sought. Relevant considerations are economics to scale, the reachability of different segments of the population to be covered, the type of program, the popular appeal of interventions and who is taxed for implementing nutrition interventions.

(c) The Uses of Studies on Activity Profiles in Groups of Households

In recent years, several field studies have been conducted to determine the activity profiles of members of households during a typical 24-hour day. The ostensible purpose of these studies has been usually to
determine more accurately than heretofore the energy requirements. These "new" requirements are then substituted for the "old" requirements and it is presumed that this would provide a better estimate of the energy adequacy levels of existing diets. Such studies of activity profiles are in my view potentially useful but not in the context they are being used.

"Requirements" connote a yardstick by which to measure adequacy. If indeed any observed activity pattern (and observed body weights) are judged to be adequate, any discrepancy between energy intakes and the observed requirements (given the observed activity patterns, the relevant energy use coefficients, actual body weights and the appropriate BMR) are by definition only measurement errors in the determinants of the energy requirements and/or intakes.

The proper use of activity profile studies, in my view, should be to (i) estimate the energy use of the identified activities; and (ii) describe the consequences associated with different levels of energy intake. These are not easily attainable objectives because normally we would encounter an identification problem, i.e. energy intakes could affect the observed intake levels and vice versa. It may in fact require deliberate experiments whereby "treatments" are assigned at random to the observations in the sample.

The reason why I think it so important to perform studies on activity profiles and to analyze them in the above stated manner is, of course, because I do not believe that scientists or anyone else should be the final judge of what constitutes adequate energy intakes. To do this on the basis of the status quo seems to be a particular obnoxious way of going about
it. Contrarywise, I believe that it is highly appropriate to provide policy-makers with some of the information they need (i.e. the particular activity profile, etc. associated with different levels of energy intake) for making better informed decisions.

IV. CONCLUDING COMMENTS

I have attempted to draw a brief sketch of how better knowledge about the relationship between energy intake and activity levels fits into wider concerns of policy-makers and their advisors, as distinct from the pure scientist’s interest in the subject.

As the reader will easily discern, I have done some theorizing about the building stones of a theory and no more. Public policy intervention presumes an understanding of how groups of households decide to do with the energy intakes what they do. It has been suggested that the final outcome is determined by factors over which the group itself exercises complete sovereignty, i.e. its own preferences for leisure, for work, for present vs. future consumption, for the relative satisfaction they obtain from energy intake/outputs and other forms of consumption, etc., and is also determined by factors in the physical and socio-economic environment over which the group does not exercise control. Public intervention occurs when society is dissatisfied with the levels of energy intake or the levels of particular energy uses observed in some groups of the population, and is prepared to do something about it.

Dissatisfaction with privately determined energy input/output levels may arise because present or future national product could be increased by inducing groups to have different than the observed energy
input/output levels or from a concern with the welfare of the "under-achieving" groups. This distributional concern may be of a non-specific nature, i.e. dissatisfaction with the level of opportunities or the total level of welfare of groups of households or with specific aspects of their welfare, such as prevention of diseases or excessive mortality, the ability to work or to be educated.

To predict the relationship between energy intake and the energy used in specific activities, one needs to know how households behave, not merely physical input/output coefficients. To determine the most desirable level of energy intake and activity for society, one needs to further know the shadow prices specific to any given social utility function. To know the social utility function requires normative judgments which are in the roam of philosophy, not science.

On the positive side, it was noted that the disenchantment with using an inflexible requirement concept against which energy adequacy is to be judged is a healthy development. Although it is difficult to see how even monumental progress in measuring energy input/output relations could lead to anything like a precise determination of optimal levels of energy intake, such measurements can be helpful to analyze the partial effects on limited objectives.

Particularly useful in the above context might be studies of the entire profile of energy utilization in groups having different levels of energy intake, when energy intake levels are not unduly constrained by opportunities for its utilization in privately or socially desirable uses. In any case, even if it is not possible to state then categorically that low levels of energy availability are the binding constraints, we could still make the weaker but important statement that increased energy intakes among others are necessary conditions for higher levels of functioning.
Finally, another point made in the paper was that while there is a great deal of uncertainty about the marginal benefits of public interventions to augment existing energy intakes, there is a growing body of evidence to support the contention that the marginal cost of public interventions rises sharply with the aspired minimum level of energy intake sought for the population. However, the mere fact that we can measure the costs and know them to be high and that the benefits are difficult to measure need not become a justification for laissez-faire. Prescription for social intervention requires knowledge not only about the statistical significance of the evidence, but also about Type I and Type II errors and their respective, albeit subjective, social costs. Policy-makers and policy advisors cannot expect to escape from having to make such subjective judgments.

In the above context, it is also important to remember that policy in regards to changing the status quo of energy intake is in fact in most cases synonymous with doing something directly about poverty. A supplementary food program or the availability of foods at subsidized prices mean in the first instance that poor households are a little less poor. To what extent they will increase their energy intake or reduce other deprivations is primarily their own choice and for better or for worse cannot be controlled by governments.
References:


