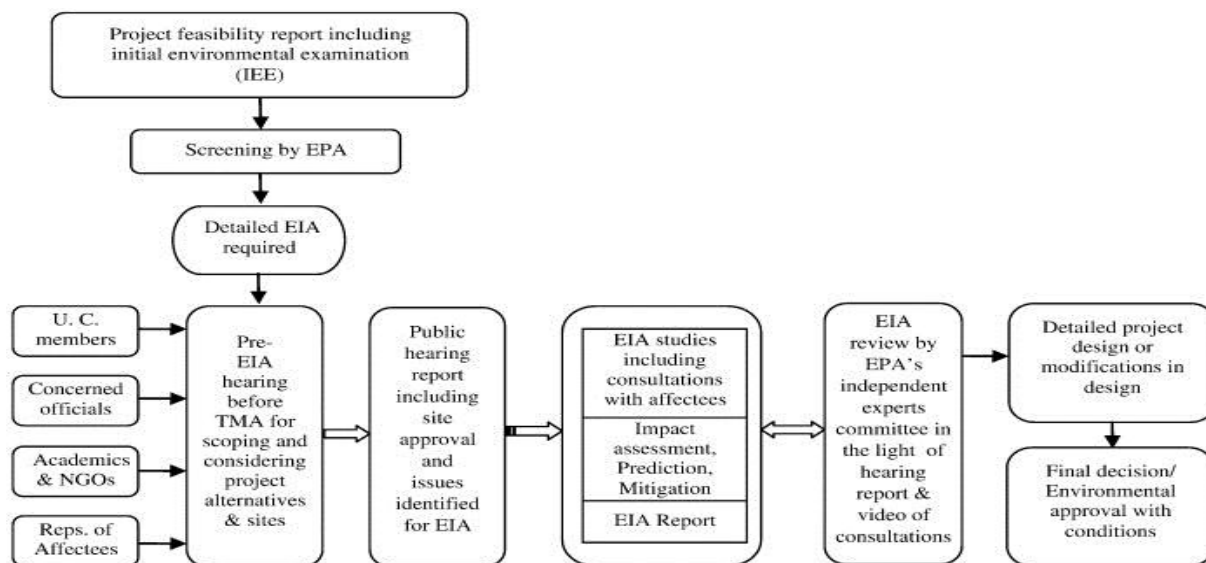


## Fallacy of Environmental Impact Assessments

*Mohsin Gul Sber Editor, Scientific Ravi*

Environmental Impact Assessment as it is practiced today is being used as a decision aiding tool rather than decision making tool, with a purpose to ensure that decision makers consider the ensuing environmental impacts when deciding whether to proceed with a project. By definition, the environmental impact assessment refers to entire process of managing, preparing and reviewing both the Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA).

The formalized arrangements for implementation of EIA system in Pakistan evolved over a period of fifteen years.



The key challenges of EIA process management and practice are to make the system more effective, more practical especially in dealing with strategic environmental assessment, more efficient and transparent, and more accountable. (United Nations University, 2004). With respect to natural environment, there are also many challenges, which are encountered during assessment of environmental impacts of activities of proposed projects in various sectors. Some of them are project specific and some are general. The major challenges include protecting human and environmental health from contamination of environment, conserving biodiversity, and safeguarding the productivity of natural resources. A survey carried out by Federal Environmental Protection Agency showed that tanneries located in Kasur and Sialkot are discharging effluent with chrome concentration ranging between 182-222 mg/lit against standards of 1 mg/lit and Chemical Oxygen Demand (COD) ranging between 5002-7320 mg/lit. A chromium salt producing unit near Rawalpindi is reportedly discharging chromium rich effluent in a water stream causing severe implications for residents of the adjacent area. Therefore, protecting human and

environmental health from the impacts of chemical contamination is one of the major challenges of EIA.

The following flow chart shows the procedure for EIA performance:

environmental health from the impacts of chemical contamination is one of the major challenges of EIA.

One of the major drawbacks in the EIA package is that it does not have guidelines for public consultations. Public consultation during the preparation of EIA is almost non-prevalent. Although reports generally say that stakeholders have been consulted, in most cases this consultation does not happen. The public hearing notices are usually published into least read newspapers.

EPA ability to carry out their functions, particularly effective monitoring and enforcement, is constrained by problems in retaining and effective use of professional skills and expertise. Weaknesses in environmental data collection, analysis, and disclosure are important constraints on informed policymaking and the engagement of the public in policy dialogue. There is no legal mandate to EPA for coordinating in land use planning in the context of EIA. Public sector compliance with the EIA system is one of the major problems throughout the country. The private sector's compliance with the EIA system varies from industry to industry.

With the exception of some multinational companies in oil and gas sector, there is generally little environmental awareness in most industries, and there is no system in place that would prevent projects from being implemented without EPA approval.

The environmental impact of any activity or process is assessed on the basis of a deviation from the baseline or normal situation. Therefore, the reliable baseline data on ecological and socio-economic environment is a prerequisite for conducting an EIA. In Pakistan, either the baseline data are not available or patchy and fragmented and in most cases unreliable. This is one of the major factors responsible for poor quality of EIA studies being conducted in the country. The collection of primary data is time consuming and needs resources, therefore, most of the consultants rely on the data, whatever or wherever it is available or alternatively on data from a similar habitat elsewhere.

The effectiveness of EIA system is seen to depend upon their successful integration within the project cycle from an early stage. The detailed form of its integration varies according to the procedural characteristics of the project cycle. The prescribed procedures for filing and review of EIA's are not followed which resulted in delays and the process is considered as anti-development. The standard of the consultancy services is also a major factor in poor quality of EIA. Sometimes the EIA reports are very good but the information is not based on complete facts. The consultants only collect information necessary to fill the prescribed format of an IEE or EIA.

The judicial support for implementation is insufficient. So far most of the actions taken are in the domain of public interest litigation instead of PEPA, 1997. There is need to improve the financial resources for supporting effective EIA review process. The fee received with the EIA reports is deposited in the federal or provincial treasury and provide EPA to meet the expenses on review of EIA reports. There is need to improve the financial resources for supporting effective EIA review process. The fee received with the EIA reports is deposited in the federal or provincial treasury and provide to EPA to meet the expenses on review of EIA reports.

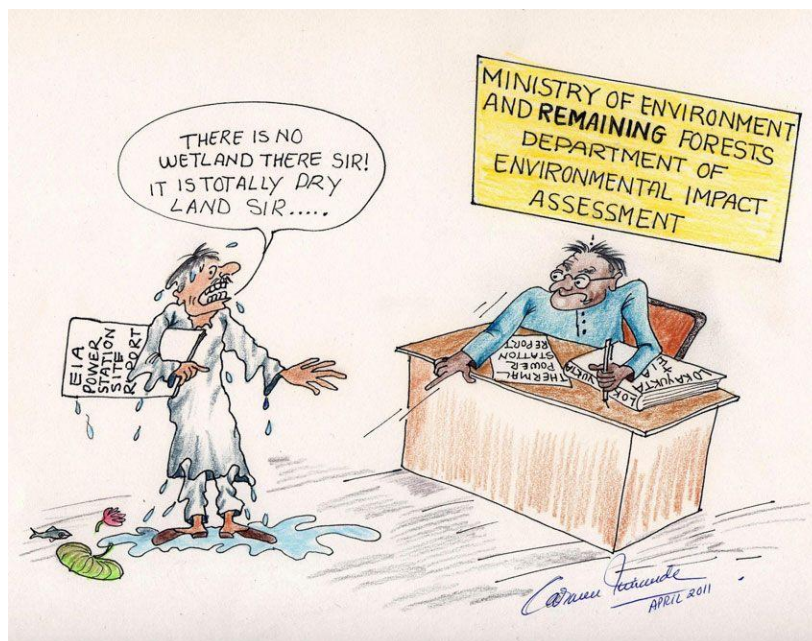
Increasing population and improper management of natural resources has been always a greater threat to Pakistan's environment. Like all other developing countries Pakistan always strived hard for economic growth, controlling population growth and fulfill the

ever-increasing energy demands rather than having concerns about the output of such processes in the form of environmental hazards. As a result, "green" concerns have never been up on the agenda. Due to more focus on economic growth and lowering the poverty rate with limited resources, the country's environmental record is quite poor. Although Pakistan was among one of the first countries to introduce environmental laws in 80's but yet it has not been able to back up its commitment to environmental protection. There are some serious steps taken at the government and industrial levels to meet the requirements of the ever-changing needs of the environment in local and global context. But it is clear that the government needs to take a step forward and give greater emphasis towards country's environmental issues.

There is a need of developing mechanisms for effective enforcement and necessary infrastructure, involving Local Governments in the implementation at the (District, kommun) TMA level under the devolved governance structure and strengthening public hearing systems through promotion of volunteerism like environmental clubs or groups comprising of experienced people from different sectors. A clear mechanism of coordination between P&D and EPA for environmental screening of public sector projects at P&D and environmental need to be developed.

Improvement of consultancy services needs to be done through a process of accreditation of consultants on the basis of transparent criteria and set up of annually renewable registration with the Ministry of Environment. A panel of experts for EIA review is needed, along with a system for compensating them. In addition, EPA is deficient in trained human resources, equipment and physical resources to support monitoring of projects in the implementation and operation stage. Capacity to address resettlement and social issues is particularly limited. Monitoring only takes place at the request and cost of project proponents, which makes it vague.

It is imperative to create integration between environmental assessment and feasibility studies. The environmental assessment team should be provided for frequent coordination meetings with the feasibility study team to exchange information. Screening section should include an evaluation of the screening process and should highlight whether significant environmental impacts exist which need further detailed study or an EIA.



For raising the level of awareness and understanding, the initiative of the Government of NWFP has taken lead in the country by establishing an EIA Center. For raising the level of awareness and understanding, such EIA centers can build up the capacity for the public and private sector organizations in the preparation of EIA studies for development projects, and in turn enhance the capacity of EPA. There is a need that other provincial governments also follow this example and establish such program.

Monitoring should be linked to impact prediction so that there is information on the nature, magnitude, geographical extent, time scale, probability, and significance of the impact. Monitoring programs need to be constantly reviewed to make sure that they are effective, and to identify the time when they can be stopped. The Responsible Authority may, at their discretion, set up an Environmental Monitoring Committee for any approved project to assist and guide the proponent in the management of the monitoring program. Such action shall be taken where the Responsible Authority considers that the scale of likely impacts, or the level of public concern, warrant such action. Environmental auditing is a review process similar to that carried out in financial auditing and can be done on a regular or ad-hoc basis. It usually takes the form of an independent 'one off' examination and assessment of past performance, such as for the audit of a contaminated site. One special type of environmental audit is the environmental assessment audit, which can provide an evaluation of the conditions of approval along with an assessment of the effectiveness of a particular Environmental Report at predicting impacts, both their type and characteristics.

In a nutshell, the encouraging role of the federal government and judiciary to support EIA, inviting expert's comments on EIA reports of publicly important projects as well as role of print media and NGOs in disseminating and supporting public concerns are the opportunities which can strengthen EIA system in the country.

*The author is the editor of The Scientific Ravi.*

### **Market Analysis of Excess Food Rescue from Famous Restaurants located on MM Alam Road, Lahore and adjacent areas**

Mohsin and Ehsan

Food rescue is a method of providing useable food to undernourished or underprivileged people, by retrieving perishable products before wastage. The ultimate destination of food products include landfills and dumpsters, which leads to a large quantity of food being wasted each year globally. It is estimated that if 5% of the global food wasted, is recovered, 14 million people can be fed (Perishable Food, 2012). Recovered food includes products which are useable yet not saleable, ranging from day old bread to meat scraps. Global Food Security is an enigma which has jolted the scientific community worldwide for discovering better food production mechanisms, but the most significant solution is the proper management of the food resources available. Restaurants, Hotels, Farms, Food processing units, etc are major contributors in food wastage, as they choose products according to their requirements and discard most of the unneeded food. Various food recovery methods have been adopted by various developed countries including United States of America, Australia and New Zealand, but the global problem is still

pertinent. Global NGOs like OzHarvest, Australia and Kaibosh, New Zealand are playing major roles.

According to the UN Food and Agriculture Organisation (FAO), developing countries waste 40 percent food items, 1.3 billion tonnes food waste annually all over the world (Rao, 2011).

Current inflation in food prices doesn't seem analogous to the way food is dumped in the restaurants and at the weddings. Leading wedding planners have raised their concern over the horrendous behavior of public towards food in weddings especially. Lack of quality control and handling protocols is evident in most cases, as useable products become useless due to the handling mechanisms, ranging from direct sun exposure of perishable products to poor refrigeration methods. Not just restaurants, but food is kept in refrigerators for days at home, and then discarded when it rots or produces pungent smell. There are no governmental agencies that monitor this process and no policies and laws exist which can, if implemented properly, reduce a significant amount of loss.

The area chosen for market analysis of food rescue is the food basket of Lahore, MM. Alam Road and adjacent areas, which are a hotspot for foodies, providing diversity ranging from leading fast food restaurants like McDonalds, KFC, Hardees, OPTP, Pizza Hut, Nandos to dining places like Freddy's, Café Atlanto, Café Zouk, Salt and Pepper Grill, Village, Memories, etc. Furthermore, sweet tooth is savaged by Mrs. Fields Ice cream parlour, Coffee and Tea Company, Gloria Jeans, Cinnabon and so many more.

Most of the restaurants and hotels have similar food waste, while few have distinct byproducts to wave off. An attempt was made to identify and quantify the food products that usually go in the waste bin. Beside the resentment and cold attitude by management of most of the restaurants, we were able to gain some noteworthy information. Common food waste includes:

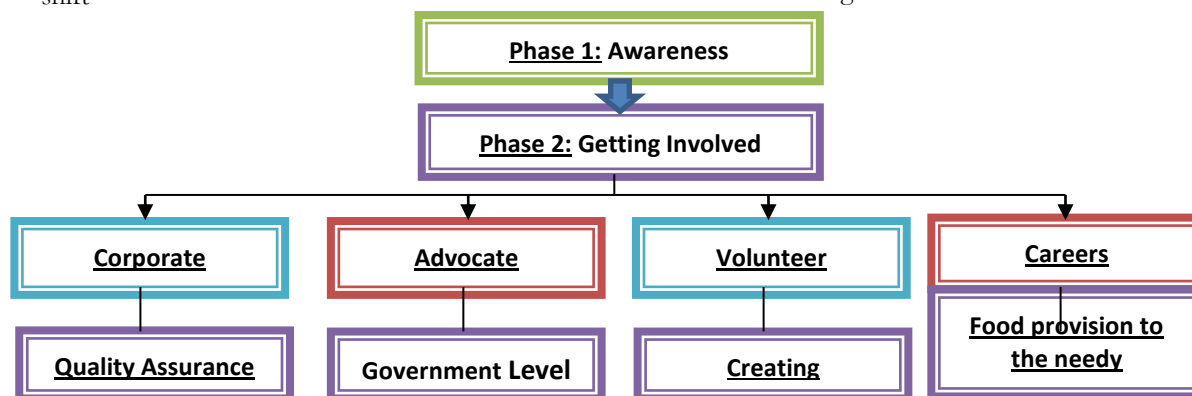
- Fruits and Vegetable used for garnishing
- Meat Shavings from cuts and steaks
- Dairy produce; milk, yoghurt, cream, cheese
- Bread trimmings from sandwiches and crumbs
- Used frying oil and margarine
- Stale cookies, cakes, other baked products
- Leftover food in plates, dishes, or by end of shift

➤ Rancid sauces, expired prepackaged products  
 Approximate quantification has revealed that leftovers in the plates, dishes and by the end of working hours are one of the largest food wastes. Others include oils used for frying and cooking, stale bakery items and fresh products, rancid dairy and prepackaged products. Distinct food waste of some restaurants includes batters used for coating meat, salad cuttings, non-potable water, etc.

**Current Status of Food Waste Removal**

Most of the restaurants stated they discard the non-useable products, while give the leftovers to their workers. On closer inspection, it was revealed by some sources that few products especially oils used for frying and cooking are sold to second-rate restaurants at lower rates. This is extremely dangerous and hazardous for the health of users because of the formation of carcinogenic agents on excessive burning of oil. McDonalds Senior Manager stated that most of their waste is sent to their warehouses, while in United States, McDonalds is now producing fuel from food waste generated at its branches in the country (Mehmood, 2012). Food is then segregated and further processed in the warehouses. Kentucky Fried Chicken (KFC) simply stated they give the leftovers to their workers while dump the used oil according to the standard procedures provided by the company. OPTP officials told that they dump their waste in the dumpsters or send it to the landfill. Salt and Pepper Grill, Village and Freddy's management were reluctant in revealing their waste dumping strategies. An interview with the Manager of 4 Seasons Banquet Hall on MM Alam Road revealed that guests at weddings deal wedding feast as a free commodity and over fill their palettes. Later, realizing they can't consume the complete food, discard most of it by either leaving it in the plate or dumping in the bin. He told that apart from their hotel, many banquet halls sell the chicken curry to B class restaurants and 'dhabas'. He stated that famous Paksitani Breakfast Places buy these products to add in their food, to reduce costs.

Market Analysis has shown that large quantities of food waste can be reduced and recovered if properly managed. This requires sincere efforts by the organizations and methodological approaches to counter-act the problem. The following proposed plan of action is based on grass root activism and organizational efforts:



### Quality Assurance and Handling Protocols

Restaurants can reduce their potential waste and make products useful if they follow certain procedures. No legislation provides protocols for food handling in Pakistan.

### Volunteer Opportunities

There are various volunteering opportunities for people at individual level or community level by repackaging donated food for use at food pantries and transporting food to charitable agencies (Perishable Food, 2012), or providing awareness to local people to avoid wastage and reduce consumption. Food recovery is possible in countries like Pakistan which are topographically diverse and are naturally bestowed with extensive food producing capacity. Given the strategies, food can be easily rescued from hotspots like MM Alam Road and other places in the city or country, and provided to the local charitable organizations, etc. In future, electronic media can be used to further propagate the concern in public and chefs can be asked to use leftovers to create some scrumptious recipes.

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### Our Better Future

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Aminah Suhail Qureshi

E. E. Cumming aptly said:

“I thank You God for most this amazing  
Day for the leaping greenly spirits of trees  
And a blue true dream of sky; and for everything  
Which is natural which is infinite which is yes.”

I was reminded of these verses while searching on internet for relevant material in order to complete my Environmental Science assignment. The reason of this reminiscence was not because I had lately finished reading ‘The Dragon Book of Verse’, but because I was much convinced by the approach of different environmentalists I had searched. Febvre and Vidal de la Blache to quote:

*“Possibilities are within the Laws of Nature. It is upon Man to utilize and exploit them in accordance with his knowledge and wisdom.”*

All the environmentalists to date have talked about environmental wisdom. They pertinently define it as the ability to sort through facts and information to make correct decisions and plan long-term environmental strategies. My teacher of the environmental science course, being an environmentalist himself, once told us to search for information so as to seek beneficial opportunities. In order to satisfy my instinct, I was determined to obey my teacher’s suggestion. Since then, I made it a routine to open majority of the links given at the end of any scientific article and write a summarizing composition on the topic under consideration.

I was assigned to search on the World Environment Day 2013. This year it will be celebrated with the theme of ‘Think. Eat. Save.’ When I first read this theme, I found

it to be very vague and undefined. The rudimentary questions which I asked myself were, “How can eating affect our environment? How can we save something by not eating? How should we define the indefinite, intricate relationship between these three words?” As I was very much uncertain about my findings, I decided to quest for every aspect of this day and its theme.

While making my assignment, I unearthed several facts and figures related to the wastage of food around the world. For instance, 200 million people can be fed with the amount of food wasted in Europe and 30% of food is estimated to be discarded each year in the USA. Despite this information being quite underlying, I was actually looking for the fundamental reasons behind food wastage. All the relevant articles were telling about the effects of scraps from a kitchen whereas my aim was to search for the causes behind the increasingly large amounts of food garbage.

Disappointed much, I sat down with a mug of coffee to jot down all the possible reasons behind the predicted food crisis. I was unable to figure out even a single! Meanwhile, I continued drinking coffee in order to widen my horizons of thinking. After finishing it, I placed the mug on one side of my writing table. I started staring at it blankly, trying to think about any valid vindication of the idea. Just then I noticed the small amount of coffee which I had left in the mug. It had never been a big deal for me, nor did I care much before. But it suddenly made me realize about all our minor contributions which are expected to lead to a major food crisis.

We all humans have one common preference – to eat healthy food. This leaning remains constant throughout the food supply chain. By food supply chain I refer to all those stages through which food passes, starting right from its harvest to the consumer’s hands and mouth. After all, the end-user of all the processes and preservation techniques, i.e. the supply chain, is the consumer. Though we all wish for a perfect life with fresh and healthy food, why do we snatch this right from others? Why do we steal others’ resources and materials just to make our lives restful and pleasant?

I was reminded of Garrett Hardin’s argument in his famous essay of 1968 called “The Tragedy of Commons.” He skilfully said that a property held in common by a number of people is eventually destroyed or at least overused until it completely deteriorates. Instead of rephrasing his particular instance of a pasture and herdsmen, I would like to take the advantage of this situation and give the example of food resources.

Pakistan is said to be the producer of more than 4000 types of dates. This can win high foreign reserves and make the Balance of Payment (BOP) favourable for our country. Unfortunately, like most other developing countries, due to incompetency and lack of preservation facilities, we lose over 37% of our produce. The food waste can be traced back to managerial, technical and financial constraints in harvesting techniques as well as

cooling and storage facilities. These losses occur mainly at the early stages of the food supply chain.

The ways by which food is wasted in developed countries is quite different from those in developing and low-income countries. In the case of industrialized countries, the behaviour of the consumers plays a huge part. The dependency of people on fast food as a convenient source of nutrition has led to making this problem enter an alarming situation. People now generally focus on the 'here and now' of local space and current time, respectively. We mostly think about the things that can be seen around us and things that have recently happened or can happen to us in the near future. It would not be wrong to say that we are slaves of our short-sighted approach.

The 'fast food trend' has made people insensitive and irresponsible. The accessibility and abundant availability of a variety of burgers, pizzas, sandwiches and hotdogs has increased the reliance of the working class ready-to-eat food. This heavily contributes to the annual food wastage. To illustrate, a man working in a multinational company bought a charbroiled burger along with french fries and a glass of soft drink. After eating half of the burger, he suddenly started feeling full and satiated. He threw his leftovers in the nearby bin. While he was doing this, a starving child was observing this scene. As soon as he found the man walking away from the trash can, he ran towards it and greedily hunted for the eatables the man threw in it. The young boy was finally successful in finding a 'fresh', deliciously-grilled piece of meat and soft bun. As expected, the hungry boy sat down near the bin and enjoyed his windfall meal. It would not be wrong to say that the man originally stole and wasted the child's share from the burger; mere purchasing powers cannot make one the ultimate possessor of all riches.

Approximately one-third of the food produced in the world for human consumption annually is wasted by consumers in rich countries. The rough amount of food wasted reaches up to 1.3 billion tonnes. The idea sounds completely absurd as how can a man's action of throwing a burger in the bin account for such a large amount of wastage. In actual, the man contributed his minor share in the food crisis. He was not the only one who did not think before throwing the food he had bought; he was just an example representing half of the world's population. We throw away vegetables and fruits with minute imperfections. By applying our environmental wisdom, we can actually save them from being wasted by slicing the defected portion and using the rest normally.

By analyzing closely, we can identify two major factors contributing to the prevailing vicious cycle of food wastage and shortage. One part of the world is overwhelmed with natural resources but lacks technological advancement, whereas the other region has been successful in developing industries and progressing in technology but is deficient in resources. Environmentalists have referred to these problems as the

Bomb of the South and the Bomb of the North, respectively.

The foundations of these problems were laid during the economic stage of Industrialization. In England, the Industrial Revolution began in 1800s. The country progressed in traditional industrial technology. Due to little awareness and abundance of resources, the industries built were less powerful and resource-efficient. As a result, the throughput of materials and energy in the society heightened to a level where it became difficult to fulfil the demands of consumers. Consequently, industrialists started exploiting the virgin resources of regions like Indian subcontinent, which they often called "The Golden Sparrow".

As a matter of principle, whenever we buy a commodity, we pay a price. Earlier, this was done by employing the barter system but with the gradual development of human economics, the now-popular monetary system was introduced. Unfortunately, the true costs of the natural riches were never paid to these resource-rich nations, thus giving rise to the emergence of third-world or developing countries. The idea might sound unreasonable and senseless but it can be proven easily by considering a simple factual analogy.

Pakistan has an agro-based economy, therefore the lion's share of our exports comprise primary agricultural products. Since we lack in industrial and technological progress, we ought to buy expensive machinery, raw materials, necessary and luxury items from the little revenue generated from the exports. If examined closely, Pakistan's export products majorly include unprocessed natural resources, the true cost of which is never paid. After all, how much revenue can raw vegetables and fruits generate? Hence, much of our 'earnings' are spent on buying the processed versions of our primary products. After importing expensive commodities, the government fails to distribute the remaining part of the revenue justly. Much less amount is allocated to the food management-related ministries. Consequently, the developing countries become prone to food crisis.

Valuable products of natural resources like various types of processed fruits and vegetables, pure cotton clothes, healthy tea leaves, aromatic cocoa beans, and precious ivory ornaments majorly allure people living in the technologically advanced countries. Many trophy-hunters travel to well-stocked lands and vandalize by hunting illegally. In this way, the actual price of the resources utilized and exploited is never paid to the host countries. If only people in the developed Northern Hemisphere started paying for the environmental goods and services they enjoy, there would not be any need left for giving charity and foreign aid to the poor but resource-rich nations. This idea can serve as a key solution in solving the 'snowball' crisis of food shortage and wastage.

The current stage of human development has been titled as 'Transition'. It has also coined the term of 'Sustainability' which means meeting the needs of today without reducing the quality of life and environment for

future generations. With continually increasing world's population, the throughput of food materials has also greatly heightened; we are consuming more resources and producing more waste than ever. Despite the economic impact of food wastage, it also leads to wasteful use of fertilizers, pesticides and fuel required for transportation.

Excessive quantity of rotting food produces high amounts of methane, which is one of the most harmful greenhouse gases. The implications of greenhouse effect on our environment are not hidden. Its end result is global warming which occurs due to ozone depletion. This phenomenon further reduces world crop yield. It is expected that by 2100, rice and maize yields in the tropical regions will decrease by 30-40% because of higher temperatures; decrease in yields as a result of stressed water supplies due to increasing temperatures has not been taken into account. Future warming of the Earth's surface by 3°C could result in crop yields falling in low latitude, temperate regions, leading to a reduction in global food production and an increased risk of malnutrition.

We need to change our approach. We must raise awareness among industries, retailers and consumers. The observance of days like the World Environment Day is meaningless until the collective mentality and approach of the society is not revolutionized. We must become aware of our surroundings and living standards of our fellow humans who have an equal right to eat and go to bed without hunger pangs. As the growing population has put much pressure on the environment, the idea of sustainable consumption seems to serve as the only light in the dark. We can change our unsustainable living standards through environmental wisdom so as to reduce our ecological footprint and, also, 'foodprint'.

While writing this essay, I completely finished my coffee for the first time ever. I pledged to serve as an environmentalist in order to make this planet equally loveable and beautiful for everyone. But a change in my lifestyle alone is comparable to a single grain of sand in one pan of the balance and a whole bulk of fine sand in the other. By taking minor steps such as thinking wisely before eating and thus saving food from being wasted, we can lay the foundations of our better future.

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### Use of Coal in 21st Century

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*Dr. Farid A. Malik (Pakistan Science Foundation)*

Coal has met the energy needs of humans for centuries. The decline of this fuel resource started in the mid-20<sup>th</sup> century when large reservoirs of oil and gas were discovered. Despite the environmental degradation by the combustion of coal, most large economies of the world are dependent on its use. Countries like USA, China, India, Malaysia, Russia and Germany produce power by burning coal. The Koyoto Protocol has put a lid on the direct use of this fossil fuel. The entire civilised world, including Pakistan but excluding USA, are

signatories to this agreement. As US meets around 56 percent of its energy needs by direct combustion of coal, it refused to be dictated by the Koyoto Protocol. Instead the Obama administration launched a program called "Futuregen" to control emissions from coal-fired plants. Oxygen is introduced at the top of the combustion chamber to convert carbon monoxide (CO) to carbon dioxide (CO<sub>2</sub>), which is then collected and stored in underground silos to be disposed later. There is negligible emission of gases that cause the greenhouse effect. In USA, no new plant based on direct combustion of coal has been built in the 21st century. In short, the environment has become important for the world and even the lone superpower has to respect it. So, the mistakes of the past cannot be repeated.

Against this backdrop, Pakistan is moving in the direction of large-scale use of coal. The Thar deposit in Sindh is one of the largest in the world (175 billion tons). Punjab too has around 600 million tons of coal, which can be used as an energy resource. After the passage of the 18th Amendment, the provinces can generate their own power and exploit their own energy resources. In other words, the provincial governments are empowered and exercise control over their own natural resources. From an energy standpoint, Punjab is seriously handicapped as it lags behind in oil, gas and hydel energy resources as compared to other provinces. There are three main energy options for the province: solar, biogas and coal in the near future. Being an agrarian area, bio-fuels like jatropha, castor also have a potential for the future. Further, The Salt Range alone has about 500 million tons of coal that can be exploited. Unfortunately, the linkages for its exploitation do not exist. The mining practices are outdated and inadequate. There are no stockpiles or coal supply chains. As a result, imported coal is being used both for burning and gasification. Recently, a process has been developed in Germany for the up-gradation of the Kalabagh iron ore, using indigenous coal at Makarwal. Due to the lack of supply chain, the process is now being shifted to imported coal. After availability comes processing or usage. Engro Energy was the first company to initiate two 600MW plants based on direct combustion of the Thar coal. To ensure supply of the coal, the company formed a Joint Venture (JV) with the Sindh government called Sindh Coal Mining Company (SCMC). Groundbreaking was planned for June 2012. It was an ambitious project costing \$4 billion. Unfortunately, the funding could not be arranged and the deposit at Thar remains unexplored. In the 21st century, therefore, the exploitation of coal requires better planning and utilization. As a country, we must develop a workable coal strategy. In the 19th century, it was acceptable to dig and then burn all varieties of coal (lignite, semi-bituminous, bituminous, coking, etc). The practice continued unabated till the 20th century. But global warming and environmental issues came to the forefront. While the energy resources are becoming scarce, the environment has also become

critical. Nevertheless, coal may be a cheap source of energy, but it cannot be burned directly in the 21st century, it has to be processed. Above ground gasification (not underground) after mining is being done under Integrated Gasification Combined Cycle (IGCC). It is called "Clean Coal Technology". Once gasified, the synthetic natural gas (SNG) can be used for multiple purposes (diesel, fertilizer, power generation, etc.). Being a relatively specialized technology, the cost of licensing is high, but can be negotiated and managed. Adhocism in this sector of vital national importance will be disastrous. In case of oil and gas sectors, there are complete chains of exploitation extending from exploration all the way to the pump. Coal continues to be a dirty business followed by primitive processing. This has to change in the 21<sup>st</sup> century. From mining to clean fuel, the linkages have to be established and it is not a small undertaking. The sector has to be moved from the 19th to the 21st century that is a big jump. All experts in the field agree that the linkages are non-existent. The issue has been raised in several international coal conferences, but remains unresolved. As coal is the future energy resource of Pakistan, we must take the lead and develop a unified plan to exploit and then convert this natural resource into a clean fuel worthy of being used in the 21st century.

*The writer is the ex-chairman of Pakistan Science Foundation.*

### **3E's (Education, Economy, Environment) in perspective of Pakistan**

*Altaf Majeed*

*"Our society is like a tree and stem of that tree is our economic structure. The branches that originate from stem are our laws, legislations and rules etc. required to run the society. While, small branches and leaves are our philosophy, religion, social norms, customs, culture etc. So, to crown all, whatever we do within a society, it all depends upon the economy of a society just like the whole tree depends upon stem for its existence"*

*(Karl Marx)*

With respect to Karl Marx, the forefather of Communism, I will add a slight to his theory, that economy as well as education both are the backbone of any society. Because, education imparts us how to live and economy makes us to live in that particular manner. So, Education and Economy are two determinants that specify our collective or social behavior within a society.

The 3Es (economy, education and environment) are three basic concepts, seem to be diverse and self-standing but they are not separate from each other. They are all interlinked to one other, for instance, our environmental health is a driving force for our property, values and economy. We cannot fund environmental restoration desired to sustain and enhance our marine industry, tourism and even our real estate market, if our

economy is not strong. Food, shelter and clothes are first priorities of every human and without satisfying these needs of a society to the maximum, we can't turn their attentions or concerns towards their environment. So, the simple and first question that comes in mind is that those persons, who have nothing in hand and worried what they will eat tomorrow, can pay their attention to the environment?

History explains us that societies that were superior in education ruled the world. Philosophy was the first ever subject instigated in Greece about 500 BC. That's why philosophy is called the mother of all disciplines, so due to supremacy in education, Greeks ruled the whole world at that time, then Romans, Muslims, French, Germans, British and now Americans are ruling the world. Education is much imperative for economic growth for a society, in turn, education and economics, both are of vital concerns for restoring and improving the environmental qualities. Educated societies can understand the bond between environment and humans and act according to it. They know what they will pay for environment today, will get in any other way tomorrow. So, their conduct is much more environmental friendly than other developing and under-developing countries like Pakistan. For instance, what will be more environmental friendly vehicle than bicycle? It is considered a transportation of the poor people but poor nations like Pakistan feel humiliated of using this in their daily life. Materialistic mindest is common amongst us. Top economies of the world use more bicycles than poor countries like Pakistan. For instance, Netherlands is in top of world economies, where among 15 million total population, 14.59 million, about 99% people use bicycle in their daily life. Denmark is on no. 2, where among 5.5 million populations, about 4.46 million, more than 80% people use bicycle daily. 3<sup>rd</sup> is Germany, biggest economy of the Europe, where 75 people use bicycle in their daily life. Although, Germany produces maximum number of cars in the world but uses more bicycles. Sweden is on no. 4, where that family is considered prestigious who has bicycle in their home, Norway on no.5, Finland on no. 6, Japan on no.7, Switzerland on no.8, Belgium on no. 9 and China at no.10 respectively, who use more bicycles in the world. These countries are leading world economies, then why do they use bicycles instead of cars? The humble answer is that they are much more concerned with their environment, economic issues and feasibility of bicycles in this respect.

On the other hand, developing countries like Pakistan feel embarrassed of using bicycles and spend billions of Dollars every year on importing cars. So, awareness is must to make people concerned about their environment and awareness comes through education. So, we can't contribute towards our environment without strengthening the quality and quantity of our economy and education. That's very miserable that according to a



recent global literacy report, Pakistan is on no. 113 in education among 120 countries, having literacy rate of just 58% and they also include people who can just write their names and simple statements.

Pakistan is lagging behind in economy, in education and as a result, in environmental quality as well. So, after discussing all forces and alternatives, we are left with just two possibilities:

First, is to sit and wait until economy and education of Pakistan become so strong and literacy rate become so high that people get awareness about their environment and react according to it or spread the awareness through the social, electronic and print media. This, I think, will not work until strengthening the economy and per capita income as well.

Second, is to impose the fines/green tax on extra waste generated by every home, every shop by government or departmental authorities. People of Pakistan have become so obdurate that awareness will not work, in my opinion, in this society; it is just enforcement, which may give better results. So, impose, impose, impose is the only option left, if we really want to do something for the environment.

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### The New Ottoman Empire

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Ehsan Gul Sher

Lahore having a population of approximately 10 million, is experiencing urban sprawl and industrialization leading to a generation of enormous amount of solid waste from many sources, like household waste, commercial activities, industries, hospitals, animal waste, all of which are contributing in creating environmental and health hazards for citizens. The city is divided into nine major towns and 150 union councils. About 5,600 tons of solid waste is generated from different sources with high percentage of organic waste (67 percent) daily with a generation rate of 0.84kg/capita per day. The rest is recyclable or unclassified in composition. The need to improve solid waste management system for the city of Lahore was recognized, therefore Lahore Waste Management Company was established to dispose the waste of Lahore on scientific basis and for making the city cleaner and pollution free. Before the outsourcing of the solid waste management of Lahore, LWMC had failed at a number of projects; for instance 9 sites were identified in the city where LMWC was dumping waste of the city illegally and due to lack of resources it was incapable of providing services to the entire city. The Solid waste management department of the CDGL had a total of 8,544 workers to perform duties regarding solid waste management in Lahore. This included 7,897 sanitary workers responsible to clean the roads and transport waste from secondary collection points to transportation vehicles for final disposal. The Former Chief Minister of Punjab Shahbaz Sharif said that a huge

sum of 2.5 billion was being spent annually for the cleanliness of Lahore; however, due to the problems of solid waste management, the new system was to be introduced with the cooperation of Turkey.

The waste management is now carried out by Lahore Waste Management Company and two Turkish companies OZPAK and Albayrak; these private firms have taken up cleanliness operations in as many as 150 union councils of the metropolis. Punjab government pays \$ 19 per ton for waste collection fee to Turkish contractors, while total solid waste in Lahore was estimated 5600 ton daily. The LWMC earns almost Rs.400, 000 a day and pays approximately Rs.1 million to Turkish companies daily. With Lahore sharing a big proportion of Punjab's Solid waste management budget and the Turkish companies in name of help or aid are scooping major chunk of earnings.

In the new system, Turk companies Albayrak and OZPAK, have mechanical sweeping and washing of roads, collection of garbage from houses and containers have been placed in different parts of the city for this purpose. There is a complaint cell for dealing with the problems of the people; smaller vehicles are being used by the Turk companies for collection of solid waste from Walled City and other congested areas.

It is worth appreciation that sanitary works have been usually found with the health and safety equipment such as masks, gloves or covers which indicates that at LWMC workers health and safety is a priority for the management. In order to inculcate the practice of managing solid waste and keeping the city clean awareness drives are a must. LWMC in recent year has conducted a wide array of awareness programs such as school programs or litter free Lahore resolution 2013.

In a recent dengue outbreak, LWMC with the Turks have played a vital role in keeping the metropolis clean which has been quoted by the former CM Shahbaz Sharif at various events.

There is a dire need of establishing small or bigger disposal sites within or in outskirts of Lahore. In 2012, landfill site construction in Lakhodehr was under consideration which is the need of the time as the booming population and waste generation rates are going higher; therefore existing landfill sites will exhaust soon and new ones will be required.

The company needs to aware the masses about disposal of waste at the collection booths such as the yellow containers, usually litter has been found around the containers. During our findings, we came across containers with no wheels or covers may be due to lack of infrastructural management therefore we recommend the company to look into such occurrences in order to avoid loss of basic assets.

Refuse Derived Fuel (RDF) can be produced from 58,583 tons/year of the combustible solid waste. Power generation plant (3 MW capacity) can use RDF to generate electricity at the rate of 34,090 Kwh per day. Currently 65,331 tons/year solid waste is openly dumped at Saggian site, having potential to emit 1.91 Gg/year CH (38,200 tons CO eq/year) based on walled city waste component. Additional revenue can be earned through the carbon credits (CDM) under Kyoto Protocol.

Outsourcing replicas are soon going to be introduced in other major cities of Punjab but with better training, infrastructural growth, hi tech equipment import and increased budgets the existing management carrying governmental institutions or private companies from within Pakistan can boost up our economy and will promote local governance. Scooping profits at name of aid or help is only helping Turks improve their economy at hands of cleaning our litter; therefore we should stand on our feet and with better development of current resources we will be able to pick, sort, manage and dispose our waste better than any outsourced company.



**Backscatter****Symbiotic Relations**

Symbiosis basically means 'living together' and in the context of marine biology refers to a close relationship between two species, for example the Clown fish and the anemone. These symbiotic interrelationships can be divided into three main categories:

Commensalism is a class of relationship between two organisms where one organism benefits without affecting the other. It compares with mutualism, in which both organisms benefit, amensalism, where one is harmed while the other is unaffected, and parasitism, where one benefits while the other is harmed.



*Commensalism*



*Amensalism*



*Parasitism*

