

INTRODUCTION

There are many options available to us in the disposal of solid waste. But one of the most problematic and dangerous ways of dealing with waste is to dig a hole and bury it. The soil which nourishes and sustains us should never become a depository for waste. Once the soil comes into contact with waste, it becomes just as toxic as the waste that it entombs. Rainfall floods this hole and washes deadly chemicals and microbes into aquifers, streams, rivers and even oceans. Anaerobic bacteria proliferate in this watery grave, emitting methane and other greenhouse gases. Instead of solving a problem, we create a problem so big that it becomes thoroughly impossible to fix. Instead of wisely managing money, we uselessly throw it away.

Often we look outside of Vietnam to find models that make sense in dealing with waste. But Europe and America have little to offer. For many decades they have dug holes and buried waste. Only recently have they begun to understand in depth the health and environmental consequences of burying waste. They are just beginning to admit that the concept of a “sanitary” landfill is anything but sanitary. For within a few decades after the plastic sheet lining this hole is laid down, it breaks, and there is no feasible way to repair leaks underneath such a mass of rotting garbage. Over time hundreds of hectares in the vicinity of this hole, as well as thousands of kilometers of streams, rivers and aquifers, are irreversibly polluted.

While Europe and America struggle to solve their waste problems, Vietnam and other developing countries in Asia have a completely different set of options available to them. To the extent that Vietnam views waste, not as waste, but as one of the most valuable resources it could ever possess, it puts itself in the enviable position of leaving Europe and America far behind.

But for waste to have value, it must be dealt with in a commercial manner. As in any commercial enterprise, we need technologies and strategies that will allow us to minimize cost and maximize profit. Obviously the first big cost that we can eliminate is the huge cost of collecting, transporting and burying waste. Estimates extended out to the year 2020 situate at about \$30 US dollars (600,000 VND) per household per year. To the extent that waste management authorities do not collect, transport and bury waste, they obviously save huge sums of money.

If we seek to maximize profitability, we must understand that waste is highly variegated, and that there is no single technology, no magic bullet, that will do the job. Each type of waste quite often demands a specific technology or combination of technologies to deliver the highest profit. At times the products derived from waste might command a price as high as \$1,000 US per ton. At other times they might have a value of no more than \$25 US per ton. But one thing is certain: there is no type of waste that must be handled and processed at a loss.

Assembling the right technology for the right kind of waste, however, is not enough. There’s a powerful socio-economic reasoning specific to a country like Vietnam that we cannot ignore. It involves tapping into the entrepreneurial spirit of the Vietnamese people who never walk away from the smallest opportunity to make money. It is this spirit that distinguishes the Vietnamese from the affluent people of the West who easily turn a blind eye to the value of waste. Let me give an example.

I know a middle-age lady who regularly walks the streets in Dalat in search of waste. She shoulders a flexible bamboo plank, and at each end is a large basket or sack filled with waste. She does not rely on garbage trucks to assist her in carrying out her task. She does not even use a push cart. She works for no one but herself, and makes on average about 60,000 VND or \$3.00 US per day, a lot more than most laborers in a rice field.

This lady does not operate out of love for the environment. Yet very few people in Vietnam do more for the environment than she. She embodies the very essence of the small-scale entrepreneurial spirit that should pervade every aspect of waste management in Vietnam. This does not mean that all those involved in waste management should resemble her in every detail. But it does mean that the primary emphasis in waste management should be away from big companies with big capital and expensive equipment.

Many tend to view the 20,000 tons of waste generated each day in Vietnam as a large-scale problem demanding state-of-the-art garbage trucks, huge bulldozers, and massive craters or incinerators that swallow endless quantities of waste. Nothing could be further from the truth. Vietnam has a large population (84 million inhabitants), but very little in Vietnam is large-scale.

Agriculture is still Vietnam's most important sector (almost 22% of its GDP), and more than two-thirds of the Vietnamese people work in this sector. There are over 11 million household farms in Vietnam, and about 90% of these farms cultivate less than one hectare of land.¹ Rice is grown on about 84% of agricultural land,² and it is cultivated in a highly labor-intensive manner. Almost all planting, fertilizing and harvesting operations are done by hand. Very seldom does one see on any of these 11 million household farms a tractor, a truck or some other large piece of equipment.

By contrast, rice farms in the USA can encompass hundreds, and at times, thousands of hectares. They employ large tractors and combines. Planting and fertilizing are not done by hand as in Vietnam, but by airplane.

If we attempted to employ this large-scale model in Vietnam, rice production would drop to nothing, and tens of millions of people would be unemployed. The large-scale model makes sense, perhaps, in Louisiana and Arkansas, but it makes absolutely no sense in Vietnam.

Likewise, the large-scale model of dealing with waste that we see in the United States and Europe, when applied in Vietnam, is equally problematic. The lady referred to in the above example operates on an extremely small-scale. Yet she and many others like her are among the few in Vietnam who approach waste at the proper level or scale, and actually know how to sort and collect waste profitably. It should surprise no one that this lady used to work as a laborer in a rice field. When she migrated to Dalat, she did not have to undergo extensive training in order to collect and sell recyclables. The transition was smooth and quick, and she now earns far more money than before.

If the technologies that we assemble to process specific types of waste are to be used effectively in Vietnam, they must align themselves with the socio-economic structure of Vietnam. They must be small-scale, low-tech and easily operated by someone like the lady in the above example. And most importantly, they must target all of the waste that she does not currently recycle.

¹ See: http://www.aares.info/files/2004_marsh2.pdf

² See: http://www.cid.harvard.edu/neudc07/docs/neudc07_poster_vu.pdf

Most of the technologies we will examine in this series of short paper are not new, but when aligned and integrated properly, they become powerful tools in ridding our planet of pollution, and in empowering and enriching the poor. Only to extent that environmental and social objectives become inseparably intertwined, do developing countries like Vietnam have a chance of addressing properly the many challenges they face as they enter the 21st century.