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DR. AKHTAR HAMEED KHAN MEMORIAL TRUST RAWALPINDI

AHKMT

ANNUAL REPORT 2023

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egoard
solid waste management & recycling to save environment

Integrated Resource Recovery Center for

CLIMATE RESILIENCE

Commissioner Rawalpindi **Liaqat Ali Chattha**,
MPCHS President **Mohammad Aslam Rao** and others at B-17

Take Action For The Environment

DR. AKHTAR HAMEED KHAN MEMORIAL TRUST RAWALPINDI

AHKMT

Integrated Resource Recovery Center

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Editorial Board

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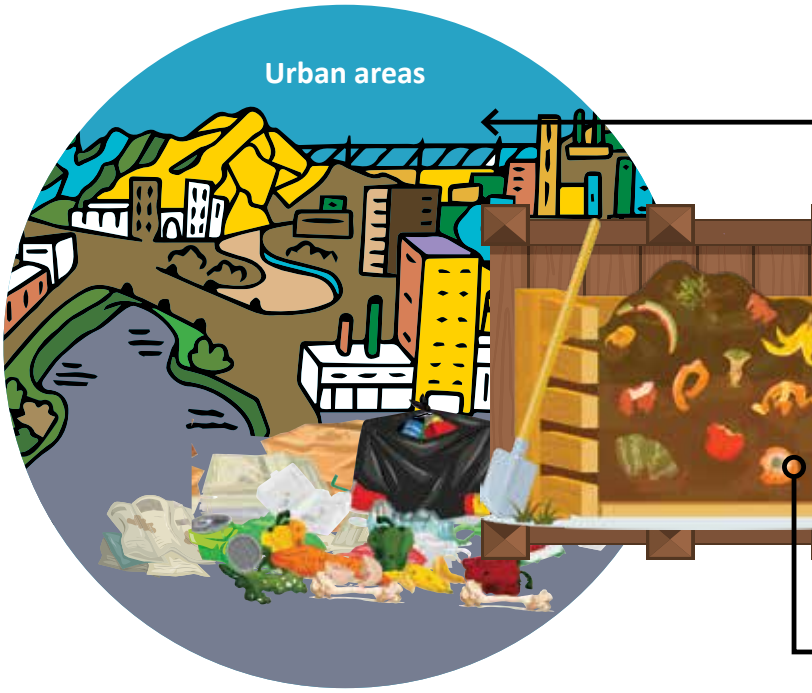


Solid Waste Management-2008-2023 - A journey down the lane

"A fifteen year struggle by AHKMT has finally made those in higher echelons of power at different levels to understand solid waste management model introduced by AHKMT to be solution for their agonies."

Municipalities in the low-income, developing countries spend a major proportion of their municipal revenues on Solid Waste Management (SWM). Yet service levels remain low while most disposals are deemed as unsafe. The situation is likely to worsen due to continuing population growth and urbanization in these countries. Like other developing countries, Pakistan too faces serious environmental problems. A large proportion of the municipal waste is either burned, dumped or buried illicitly on vacant land in many towns and even major cities, causing significant environmental damage and threatening human health.

Worse, there are no SWM systems in place to deal with potentially hazardous waste; systems dealing with medical waste are particularly inadequate. Therefore, solutions are needed urgently.

All major cities, be it Islamabad, Lahore, Rawalpindi, Karachi, Quetta and Peshawar are facing enormous challenges in tackling the problem of urban waste. The far reaching and severe effects of climate change globally have resulted in massive human and capital loss, infrastructural damages due to natural disasters and social upheaval for the most affected communities in developing countries. Ironically, the contributors to climate change are the least affected out of its disastrous effects and hence, the effected ones are those with no or very limited means to adaptive mechanisms to minimize the effects of climate change.

Dr Akhtar Hameed Khan Memorial Trust as specialists in the solid waste management, in collaboration with donors, partners, government UN Agencies and local communities tries to improve the living standards of local communities by addressing their waste management issues by committing to best practice to ensure cost-effective, safe and environmentally sound methods of solid waste disposal.

However, nobody contemplated upon solid waste management seriously.

For AHKMT it all began when in 2008 we switched over from Liquid Waste Management to Solid Waste Management while keeping in view the needs and demands of the local communities. The urbanization had led to boom of population in the urban centers which dually created a sense of requirement for addressing the solid waste disposal

scenario. It needed a proper system.

But it is also a pity that in early days and even few years ago our government institutions as well as political and administrative leaders did not even looked in a positive sense upon the work we had been doing – solid waste management.

It took us around four years between 2008 to 2012 that we learned the intricacies of solid waste management. We adopted several tools and means as well as organized several programme for creating awareness among general public, government institutions and the entire system.

We got the breakthrough in 2013 when we found a proper model for solid waste management which allowed to segregation and processing of household waste by 85%. We introduced and implemented the model between 2013 and 2015 in Pakistan on experimental basis.

Dr Akhtar Hameed Khan Memorial Trust took the charge of running the model in Pakistan in 2015 and without any external support lifted garbage from household on its own and assistance from the local community. The garbage was segregated, processed and published the data in its first annual report in 2015-2016. In this report the entire process was explained in detail including the cost and the problems faced by AHKMT in the work. The report was dispatched to all health and local and well as federal government institutions. In response we only received few words of appreciation and a letter. It was after perusal of almost one year, we were able to get a contract Sakrand Town Committee from a rural town Sakrand in less developed Nawab Shah District (Benazirabad) in Sindh. It helped us establish the second model of managing resources and generating income from solid waste.

It has been eight years since 2015 to 2023 we have been publishing and dispatching our work's report to government officials but also creating awareness among public and government institutions. We had been telling them through our reports about the disadvantages of solid waste dumping which included cost, environmental impact, health hazards

Through several programme and trainings to lane departments, district administration, waste management companies, local governments' representatives, ministry of environment, Ministry of Climate Change, Parliamentarians, academia, journalists and public we derived the facts about these aspects in detail.

Costly – Solid waste management can be expensive, particularly for governments and municipalities that must fund waste collection and treatment programs. The cost of solid waste management can strain public budgets, and result in higher taxes and fees for citizens.

Environmental Impact – Solid waste management can have a negative impact on the environment. Waste treatment facilities can release pollutants into the air and water, contributing to air and water pollution. Waste materials that end up in landfills can take years to decompose and contribute to greenhouse gas emissions.

Health Hazards – Solid waste management can pose health hazards to workers who handle waste materials. Exposure to hazardous waste materials can cause respiratory

problems, skin irritation, and other health problems. Waste management facilities must adhere to strict safety protocols to protect workers and the public from harm.

Limited Resources – Solid waste management relies on limited resources such as land, water, and energy. As the world's population grows, the demand for solid waste management services also increases, placing additional strain on these resources.

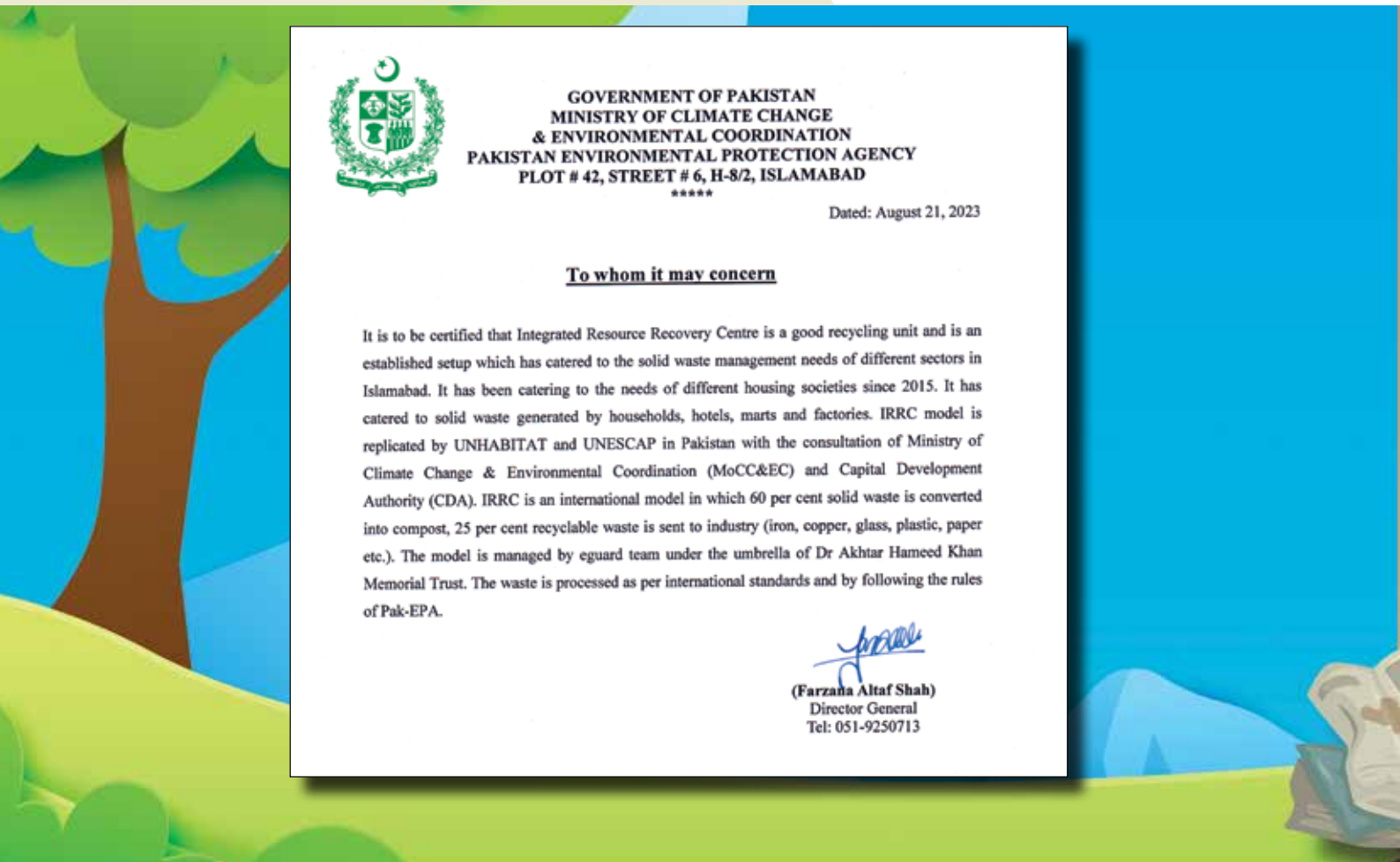
Inefficient – Solid waste management can be inefficient, particularly in developing countries where waste collection and treatment infrastructure may be lacking. This can lead to improper waste disposal, resulting in environmental pollution and public health risks.

Without any direct financial assistance, we continued explaining these aspects among different segments of society through training sessions and orientations, seminars, awareness walks, sanitation weeks. We tried to make people from power corridors understand the importance of solid waste and chalked out several PC-I with different government institutions besides developing technical and social models with local and international development organizations. We signed several memorandum of understandings with different academia as who waste can be segregated and processed by 85% and how the model could be sustained and how it can be used for resource generation, energy generation, organic food for animals and how farms and factories could be run to reduce unemployment and how this process can help environmental dilemmas.

When we played our role in assisting the flood affected persons and the adoption of climate change model our 8 and 15 years old secondary and primary models respectively got recognition and stakeholders from different cities in Pakistan started contacting us and teams from these cities visited us learn about the model. Now they seriously talk about the solid waste management. Now it has become a norm that people from local administration, academia, civil and military hierarchy, bureaucracy, local governments seriously talk about resource generation from solid waste and its proper disposal more seriously.

The integrated resource recovery centers could also be deemed as a bridge between urban and rural areas.

The aspect could be seen as a scenario in which urban areas generate the solid waste which is used by people in rural areas in shape of compost for their fields and orchards and in return the agricultural products produced by rural areas are utilized the people living in urban areas. In fact, keeping in view the environmental disasters we have been facing like the flooding and untimely rains, IRRC could be a solution for at least protecting the soil and crops from environmental damages as have been proven in the case of



GOVERNMENT OF PAKISTAN
MINISTRY OF CLIMATE CHANGE
& ENVIRONMENTAL COORDINATION
PAKISTAN ENVIRONMENTAL PROTECTION AGENCY
PLOT # 42, STREET # 6, H-8/2, ISLAMABAD
*****

Dated: August 21, 2023

To whom it may concern

It is to be certified that Integrated Resource Recovery Centre is a good recycling unit and is an established setup which has catered to the solid waste management needs of different sectors in Islamabad. It has been catering to the needs of different housing societies since 2015. It has catered to solid waste generated by households, hotels, marts and factories. IRRC model is replicated by UNHABITAT and UNESCAP in Pakistan with the consultation of Ministry of Climate Change & Environmental Coordination (MoCC&EC) and Capital Development Authority (CDA). IRRC is an international model in which 60 per cent solid waste is converted into compost, 25 per cent recyclable waste is sent to industry (iron, copper, glass, plastic, paper etc.). The model is managed by eguard team under the umbrella of Dr Akhtar Hameed Khan Memorial Trust. The waste is processed as per international standards and by following the rules of Pak-EPA.

(Farzana Altaf Shah)
Director General
Tel: 051-9250713

wheat and rice growth in Mardan and Chakwal where crops stood tall as compared to other fields when hailstorms and untimely rains hit the region earlier this year. Sindh's dates were deemed to be second largest exchequer earning crop for the farmers but for the past few years the cultivators of dates have been suffering irreparable damages at the hands of untimely rains. If the IRRCs are developed throughout the province, it will not only help reduce solid waste but also help in production of compost that can be used in cultivation process which could then help the crops stands tall against climate disasters to some extent.

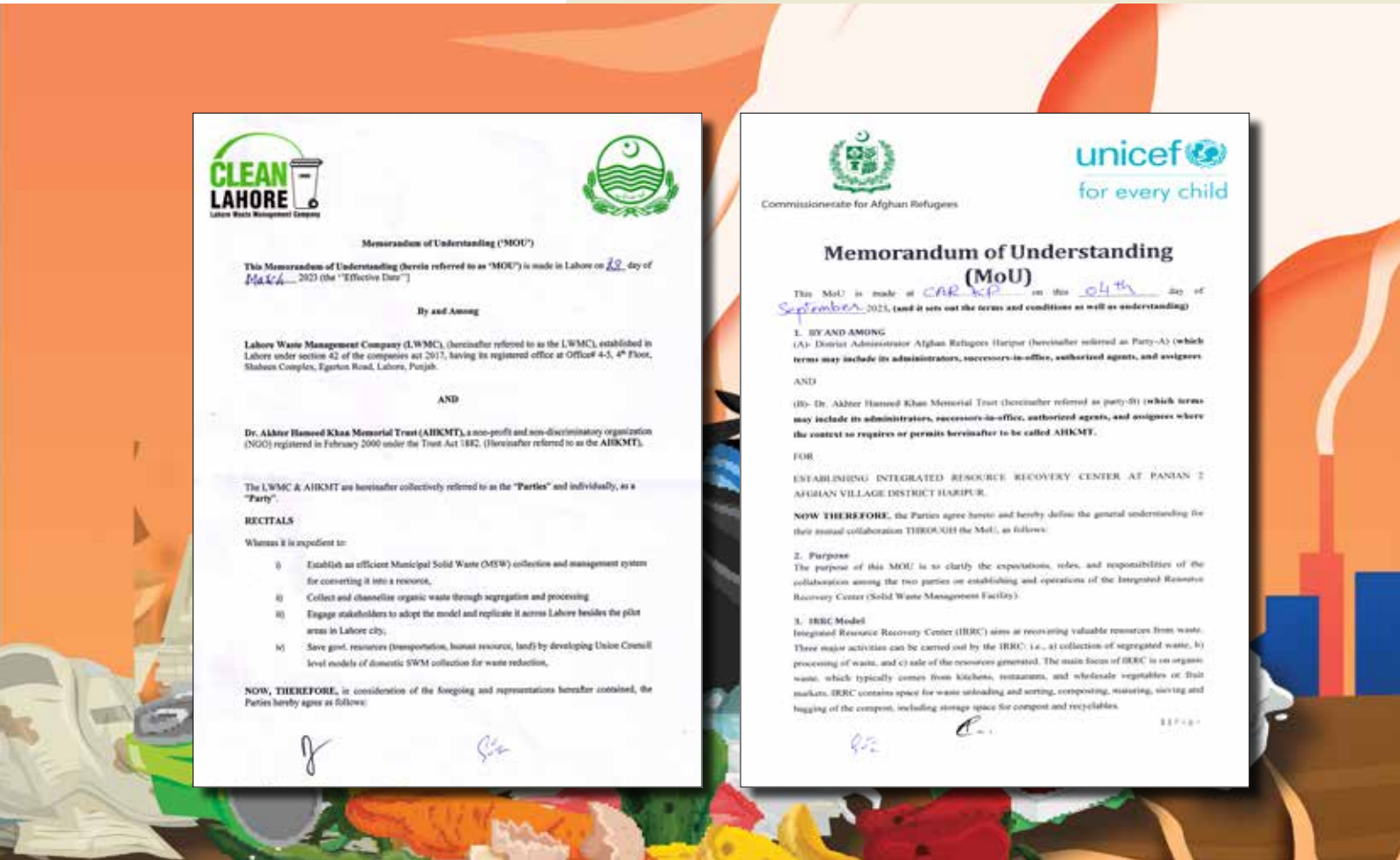
In Punjab the provincial government through district administrations has started implementing the model introduced by AHKMT. Now the universities have developed proper model for resource generation. Recently at the 8th anniversary of Integrated Resource Recovery Centers in Pakistan set up by Dr Akhtar Hameed Khan Memorial Trust in B-17 here on October 12 were of the view that waste management has always been looked as an issue from the lens of crisis which instead should be deemed as an opportunity. They said waste provides lots of openings to stakeholders who should realize that if it is treated as a business model around the world, then the time has come when it should be treated like an opportunity in Pakistan too instead of a crisis. And top speaker among them was Commissioner Rawalpindi Liaquat Ali Chattha who make it clear that he would like that such projects should be replicated in other towns like Murree where waste is collected in small dumpers and then transferred to Islamabad and then in Rawalpindi's Chak Beli transfer station then why not such system should be replicated in Murree so that it can help address their solid waste woes. He was of the view that this is a matter of contemplation for all in the society that an initiative by this housing society is appreciable and this should be further developed and the people working on this model should replicate it in other housing society.

Even private housing societies like MPCHS, Jinnah Garden, Jammu and Kashmir Cooperative Housing Societies in Islamabad worked on the model with our assistance and established their integrated resource recovery centers.

Generally, it is observed that housing societies mostly work on developing parks, hospitals, schools and other welfare projects and they also allocate plots for sewerage treatment plants but don't allocate any space in their respective societies for solid waste management. Therefore, the authorities concerned should bound them in their legislation that they will also allocate some part of the societies land for solid waste management.

However, only AHKMT cannot win their battle alone. Others must come to the fore. More people are need and in order to assist them we have developed a proper syllabus and course and also authored few books. We have also contacted universities to start a six-month diploma for students on solid waste management.

We have also started working on getting business of solid waste management to be registered as proper trade and also established ETC. a person who is less educated or that who has done his PhD can do this course can get their company registered and they could do their own business after reaching an agreement with a town committee, municipal administration or a government institution. They can also get job in these organizations and thus can help save the environment and serve their country but also create a safe future for the future generation.



8th anniversary of IRRCs celebrated in Pakistan

Integrated Resource Recovery Centers in Pakistan 2015-2023

IRRC B17

IRRC G15

IRRC Mardan

IRRC Sakrand

IRRC Jinnah Garden

Bio-Compost Plus

Vermicomposting

BSF Black Soldier Fly

IRRC Black Soldier Flies and Earthworm Unit

E-Guard Training Centre

Organic Jaggery (Gurr)

Mint

Stevia

Research and Studies

8th anniversary of IRRCs celebrated in Pakistan

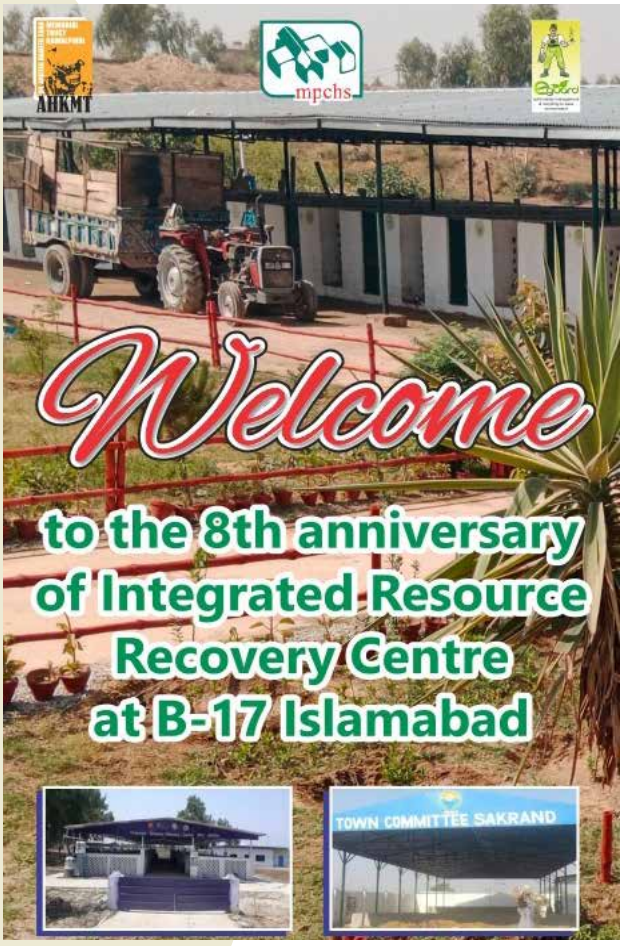
> Solid waste should be deemed as opportunity instead of crisis

8th Anniversary of IRRCs set up by AHKMT

At the 8th anniversary of Integrated Resource Recovery Centers in Pakistan set up by Dr Akhtar Hameed Khan Memorial Trust in B-17 here on October 12, 2023, the speakers were of the view that waste management has always been looked as an issue from the lens of crisis which instead should be deemed as an opportunity. They said waste provides lots of openings to stakeholders who should realize that if it is treated as a business model around the world, then the time has come when it should be treated like an opportunity in Pakistan too instead of a crisis.

They were of the view that the enormous volume of municipal solid waste generated daily in the twin cities of Rawalpindi and Islamabad is causing environmental degradation and the authorities concerned should take the bull by the horn and address the serious issue to avert an environmental disaster. Current practices of dumping waste are creating environmental disasters and contributing towards climate changes. Inappropriate waste management contributes to increase not only the emission of water, atmospheric pollutants and odors, but also the emission of greenhouse gases (GHGs).

Commissioner Rawalpindi **Liaqat Ali Chattha** was the chief guest of the ceremony which was presided over by Multi Professional Cooperative Housing Society (MPCHS) President **Mohammad Aslam Rao**, while the guests of honor included MPCHS Vice President **Chaudhry Zafar Ali**, MPCHS Secretary



Chaudhry Nadeem Sarwar, AHKMT CEO **Sumaira Gul**, AHKMT Board Members **Edwin Samson**, **Almas Shakoor**, e-Guard CEO **Hamid Ullah** and **Bilawal Khan**.

Speaking on the occasion, Commissioner Rawalpindi Liaqat Ali Chattha said that he was pleased with the work of AHKMT and MPCHS, and stressed the need of taking small steps to address the issue of solid waste. He recalled how urbanization has led to the massive growth of Rawalpindi's population that has dealt a blow to the expectations of city planners. Regretting that waste management had never been a priority of city planners, he hoped that the time has come to address this serious issue more seriously and IRRCs should be replicated in rest of Pakistan to address the issue.

> *"IRRC is an industry and it should be replicated in Rawalpindi division"*
> **Commissioner Rawalpindi**

MPCHS has been doing a commendable job for its residents and I would like to appreciate people like Ms. Sumaira Gul, CEO of Dr Akhter Hameed Khan Memorial Trust for doing such a commendable job. I would like that such projects should be replicated in other towns like Murree where waste is collected in small dumpers and then transferred to Islamabad and then in Rawalpindi's Chak Beli transfer station. Why not such system should be replicated in Murree so that it can help address their solid waste woes. This is a matter of contemplation for us that an initiative by this housing society is appreciable and this should be further developed and the people working on this model should replicate it in other housing society. I would make sure that all such projects which we will launch like PHA is going to launch its project and deputy commissioner Attock has worked on it and this model is going to be replicated there in two to three union councils. This year current Punjab government particularly chief secretary Punjab and chief minister Punjab have introduced sweeping services in each and every union council at village level for improving the cleanliness in these areas and if we can establish IRRC like setup at each union council level then they will not require dumping sites and waste could be disposed of in an environment friendly manner

"Looking at all the items put on display at the IRRC make me feel that it is a comprehensive industry and the people attached with the project like the CEO of Dr Akhtar Hameed Khan Memorial Trust deserve appreciation. Project like these could be in private housing societies as well as public sector in Murree, Jhelum, Attock, Gujjar Khan and Rawalpindi," he pointed out.

Similarly, the rain harvesting project being run by is a commendable experiment as this water is being used for watering the plants.

If this IRRC model is replicated at the union council level that help alleviate the miseries of the people and reduce

their waste. Currently the solid waste dumped in the area on the outskirts of the city has piled up like a huge mountain and the residents of the surrounding ten to fifteen villages are bearing its brunt but nobody has been able to find a solution to this problem. But in my view this is the solution that I have seen today and hopefully. This thing has started to move and there are many people in housing societies who are progressive and working and I appreciate them. I will try to extend my full support to them. We should work on improving the environment of the society. I have asked my director local government that we should introduce and amendment in our laws for the approved housing societies that each and every housing society should manage their solid like MPCHS is doing. Earlier it was an obligation for housing societies to leave land for solid waste management, but now taking a step further we would like them to establish the IRRC themselves.

In her keynote speech, Sumaira Gul, shed light on journey and achievements of Dr Akhtar Hameed Khan Memorial Trust. "Dr Akhtar Hameed Khan Memorial Trust has established Integrated Resource Recovery Centre (IRRC) setups in Islamabad, Sindh and Khyber Pakhtunkhwa. The IRRCs established in Sakrand, Sindh, Islamabad and Mardan have proved fruitful and our journey is expanding and now we are working on establishing IRRCs in Hazro Attock and Haripur," she said.

Making a handful of suggestions for Rawalpindi District Administration, Sumaira Gul said the solid waste should be segregated and then processed for which IRRCs, are proper platform. "It is a decentralized recycling and composting facility, which is built and operated at low costs by using limited mechanical technology, ensuring low operational costs and minimal equipment breakdowns. If local authorities want to utilize this facility for proper solid waste management then a waste treatment plant can be developed and handed over to a nongovernmental organization or other private local company for proper disposal of solid waste," she added.

AHKMT, she said has developed a model for solid waste management called 'e-guard model', which mainly focuses on the primary collection of the waste from selected house hold in a particular area. Their range could be expanded like the way waste is collected from Rawalpindi by Rawalpindi Waste Management Company (RWMC). The collected waste material is treated at the IRRC, which is a simple and cost effective model of solid waste management. "The solid waste material is collected, segregated and processed by using modest technology for processing. It recovers valuable resources by converting organic waste into compost, which is later sold in the market as an end product and used as fertilizer," she claimed.

Speaking on the occasion, Multi Professional Cooperative Housing Society (MPCHS) President **Mohammad Aslam Rao** also appreciated IRRC team and said that; **"The model provides a practical solution to overcome the insurmountable waste management challenge of the country in the environmentally sustainable manner and our society is reaping its benefits"**. He said that it is an environment friendly model and it provides opportunities to societies like us adding to the value of our housing schemes besides helping the societies earn appreciation from government organizations like Pak-EPA and Capital Development Authority for processing solid waste instead of dumping it.

MPCHS Vice President **Chaudhry Zafar Ali**, said: **"IRRC B-17 is a wonderful project of waste management and the management of MPCHS and AHKMT should be given the credit for setting this up."**

Integrated Resource Recovery Center (IRRC)

Integrated Resource Recovery Center (IRRC) is a South Asian model promoting public, private and community partnership. IRRC is a physical facility where organic waste is processed and results in 10% compost production in a cost effective way by recovering value from waste besides providing provide livelihood opportunities to poor communities through a decentralized approach.

- Uses appropriate environment friendly technologies for reducing burden of waste and creating economic opportunities
- Operate and demonstrate 3Rs (Reduce, Reuse, Recycle) principles
- Capacity can range from 2-20 tons/day (manual)
- Provides higher sustainable income and better working conditions for waste pickers and other urban marginalized communities

- The flexibility of IRRC model is such that it can be adapted to any situation both in urban and rural areas. Moreover, it can be implemented in slum areas with any one small, medium or large scale.

IRRC Story in Pakistan

Dr. Akhtar Hameed Khan Memorial Trust (AHKMT) and e-guard have successfully replicated the model of IRRC in Pakistan in different housing societies like Jammu and Kashmir Cooperative Housing Society (JKCHS) in Sector G-15, FECHS-Jinnah Garden, (MPCHS) B-17 Islamabad and then in Mardan, Sakrand. This model has been taken to different scenarios and geographical contexts covering Fruit and Vegetable Market, I-11, Islamabad to Sakrand, a township of Sindh for resource recovery from solid waste generated by around 10,000 households.

IRRC in Mardan (Khyber Pakhtunkhwa)

AHKMT and e-guard in collaboration with Water and Sanitation Services Company Mardan (WSSCM) and NCA through a tripartite partnership designed infrastructure of IRRC at Mardan in 2019. The project was aimed at ensuring long-term sustainability, successful replication and up-scaling of the facility not only within Mardan but also in other districts of Khyber Pakhtunkhwa.

WSSC with technical support of AHKMT deals with 5-ton green waste generated in Fruit and Vegetable Market Mardan and processed to generate around 0.5 tons of compost daily. Half ton compost can help fertilize around half an acre of land which is cost effective. It directly benefited the urban marginalized population, provided waste pickers with more stable incomes and safer working conditions. Every 5 tons' waste produced jobs for almost 30 persons with stable income and good working conditions.

The key achievement and impact of the IRRC model was to transform attitudes of local community towards waste management. Households, market vendors, restaurants and businesses showed supportive approach to separate organic and inorganic waste at first step. WSCC Mardan motivated farmers to use organic compost to help reduce their cost on chemical fertilizer. It supported the district government to save cost of resources to transport waste to landfill other than environmental benefits for communities and all living organisms.

Sustainability

In the past three to four years, WSSCM has produced tons of compost that has reached to the proportion that it had to auction it twice once in Year 2020-2021 in which tons of organic compost was sold while in May 2023 WSSCM has also auctioned another set of 120 tons' compost to be sold which has proven the sustainability of the IRRC model.

Waste to Resource

The waste-to-resource approach promotes a paradigm shift in the management of solid waste. Under this approach, rather than viewing waste as a problem and burden, it is seen as a valuable resource, one that can be managed to produce sustainable benefits for a range of actors.

IRRCs can be initiated and operated by municipalities, private sector enterprises and civil society organizations or a combination of all these through different partnership models, thus strengthening governance at local level.

Like WSSC Mardan five to six companies have been established in Khyber Pakhtunkhwa that can adopt the model and provide benefits to governments and local communities. IRRC Mardan, Sakrand and Islamabad are good models for rest of the country particularly larger metropolitan like Lahore, Karachi and Peshawar to replicate them for larger benefits of the country.

Innovative solutions to identifying gaps and integrating municipal solid waste management sector

Waste is one of the biggest challenges faced by our society. If not handled correctly, waste pollutes our natural environment with devastating results. However, it seems almost unavoidable that our society generates waste. Municipal solid waste (MSW) management is a global concern, especially in low–middle-income countries such as Pakistan, which require the addressable of MSW treatment issues to attain sustainability in the waste sector. The prosperity of municipal solid waste (MSW) collectors, i.e., the sanitary workers, is critical in the waste management hierarchy. Hence, the health, safety, social welfare, economic conditions and overall wellbeing of this tier need to be focused on more.

Sub Governance Network (SNG), under umbrella of Oxford Policy Management Unit, introduced Dr Akhtar Hameed Khan Memorial Trust (AHKMT) with Lahore Waste Management Company. Ali Hannan, CEO of LWMC initiated talks AHKMT. While the Memorandum of Understanding was signed by Mr Babir Sahib Din. Mohammad Riaz district team lead from SNG played a pivotal role in coordination between AHKMT and LWMC.

Dr Akhtar Hameed Khan Memorial Trust joined hands with Lahore Waste Management Company and conducted Solid Waste Segregation Resource Recovery Practice and a Study in different locations of Lahore including GoR-1 and Moon Market between April - June 2023 to identify and explore various options of waste recovery as resource and finding innovative solutions to integrate municipal solid waste sector.

Babur Sahib Din, CEO LWMC asked AHKMT team to conduct a week long study to better understand the solid waste generation and its disposal in the area.

On his behest, AHKMT conducted a study in June which covered the waste especially recyclables which come out of domestic and commercial areas in hands of scavengers and private waste collectors. Further the study peeped into the scrape dealer's places where the scavengers and waste collectors sell their collected waste items. The study got the insight and expert opinions of managerial, supervisory and sanitary workers of LWMC regarding resource recovery.

The study found out that there is a huge potential in the area of resource recovery and especially LWMC staff has an understanding that resource recovery can be a healthy stream of revenue generation for the company. Moreover, it was also discovered that informal sector has better experience of dealing with recyclable items of waste and their expertise should be utilized.

Objectives of the Study:

The main objective of the study was to understand the behavior and practices of the various stakeholders dealing with solid waste. Gather handy information and knowledge about the recyclable items, to guide revenue generation plan to the LWMC.

Methodology:

The study included the following methodology:

- AHKMT technical experts of research and solid waste developed tools for getting data from various stakeholders already engaged with the recyclable items.
- AHKMT team tested the developed tools and amended them as per results.
- The study involved a team of volunteers from Punjab University for conducting the study.
- All the enumerators were oriented about the tools, data gathering techniques and dos and don'ts of data collection process.
- AHKMT senior experts of solid waste were also present during data collection for achieving best results.
- Data collection was done through interviews of various stakeholders including LWMC officials and sanitary workers, members of trader's associations, vendors, scrape dealers, scavengers, street hawkers, private waste collectors from domestic areas, private waste collectors from commercial areas.

Recommendations to LWMC

Through the study, AHKMT recommended that LWMC should establish a specific unit/ department which deal with resource recovery. LWMC was also asked to set up a primary waste collection system from households which will provide opportunities to generate sufficient revenue through resource recovery and other streams. The major focus, AHKMT emphasized should be given to the recyclable items which scavengers do not pick from the waste like shoppers, thermophore, clothes, shoes, etc. The research team from AHKMT called for diagnosing the issues of these items and need to work on creating a mechanism and finding out what sort of demand such things have in the market. The study suggested establishing green waste enclosure separately which would be called as Green Line to get good green waste for compost.

Findings of the Study

- The response of all stakeholders was positive and they participated well and shared their views. This positive attitude will help to implement circular economy model at Lahore.
- The private scavengers and waste collectors are not under regulations, the regulations will help to improve the system and environment as well.
- 80% LWMC workers segregate recyclables out of waste and sell it.

- Trader's association responses were very positive; 90% responses were good regarding the SWM facility by LWMC in Markets.
- The response reflected that the main issues are lack of community cooperation, green waste being dumped and non-formal waste segregations.

Recommendations and Way Forward:

- LWMC need to establish departments of Resource Recovery & marketing of products (compost and recyclable items)
- Need to focus on the segregation of recyclable items, shoppers, thermophore, clothes, shoes, its sale and purchase
- Separate enclosure for Green waste, as Green Line for compost. current practice is mixed up which requires a lot of efforts for segregation.
- LWMC should award contract to such contractors who also manage segregation of, Recyclables and green waste as well on revised rate if required.
- LWMC start primary collection from 5 UCs and would scale up after success. (with engaging PWC)
- Compensate the vehicle drivers for Green waste collection & transferring to the Mahmood Booti
- The composting unit and its marketing can be outsourcing to any private firm or individual.
- There is need to establish a storage place for recyclables for better price of items sale near every enclosure.
- Develop model streets and model commercial areas where waste bins are available, segregation at source
- Education of housewives / Maids and Schools students on 5RS
- Products development out of recyclable items through policies and regulations, service charges to community.
- 100% Door to door primary collection, central facility at town level for segregation unit, storage of recyclables.
- The circular economy will demand innovative ideas, initiatives and decisions of LWMC higher management. Traditional thinking and fears of failure and will not yield desired result

Workable Ideas and Options

- Option1. Initiate licensing to loader rickshaws which are involved in waste collection of in different parts of city
- a. Issued a slip to the scavengers on payment for sorting recycle able from enclosure
- Option2. Outsources enclosure sorting @ Minimum / per ton, per day, for segregation and resource recovery. (100 ton give 5 lake per day)
- Option3. Give incentive to LWMC sanitary workers against their work in recyclables items resource recovery for 5 items

1.Data of Waste Segregation (Waste Recovery):

Number of Points (Working Areas): GOR-1 and Moon Market

Progress Data

Description	GOR-1	Moon Market
Total Working Days	45 LWMC +1 Private	52
Total Working Hours	76:10	139.25
Total Bags	196	540
Total Weight Segregated Recyclables	1,672.2 Kg	609.23 Kg
Total Weight of Green Waste	25,190 Kg	16,850 Kg
Total Estimated cost of segregated green waste	Rs37,785	Rs25275
Total Estimated cost of segregated Recyclables	**Rs34,641**	**Rs18,356**

Total Recyclables Waste Date at GOR-1:

Item	Weight in KGs	Amount in Rs
Shopper	206	2,660
Plastic	86.7	8379.
Paper/ cardboard	260	7280
Glass	82	426
Cloth	661	3,305
Shoes	107	535
Tetra Pack	164.4	3,616
Thermophore	105.5	8,440
Total	**1,672.2**	**34,641**

Total Recyclables Waste Date at Moon Market:

Item	Weight in KGs	Amount in Rs
Shopper	184.9	1849
Plastic	17.7	1699
Paper/ cardboard	12	336
Glass	0	0
Cloth	225.96	1129.8
Shoes	0	0
Tetra Pack	3	90
Thermophore	165.67	13253.6
Total	**609.23**	**18356.6**

LWMC - COMPOST PLANT

(MoU) Akhtar Hameed Memorial Trust

Daily Green Waste Received

Sr.No	Date	Vehicle				Remarks	
		No	Waste+Vehicle Wt (kg)	Vehicle Wt (kg)	Actual Weight Received (kg)		
1	30-Mar-23	LES-7509	16410	12730	3680		
2	31-Mar-23	LES-7509	17740	12730	5010		
3	01-Apr-23	SAA-785	10200	9180	1020		
4	03-Apr-23	D-44	6750	4860	1890		
5		D-20, SAA-780	12080	9220	2860		
6	05-Apr-23	SAA-784	11710	9050	2860		
7	06-Apr-23	D-24, SAA-794	11990	9210	2780		
8	08-Apr-23	D-24, SAA-794	10030	9210	820		
9	11-Apr-23	D-24, SAA-794	10640	9210	1430		
10	12-Apr-23	D-20, SAA-780	11250	9220	2030		
11	14-Apr-23	D-20, SAA-780	10230	9220	1010		
12	17-Apr-23	LES-7509	14780	12730	2050		
13	29-Apr-23	D-31, SAA-890	11120	9130	1990		
14	01-May-23	D-31, SAA-890	12190	9130	3060		
15	02-May-23	D-23, SAA-787	11080	8980	2100		
16	04-May-23	D-31, SAA-890	11320	9130	2190		
17	05-May-23	D-31, SAA-890	10870	9130	1740		
18	06-May-23	D-31, SAA-890	11460	9130	2330		
19	09-May-23	D-24, SAA-794	10600	9110	1390	**42040**	**kg**

2. Recyclable Material Sale Summary

Date of Commencement: April 1st - May 31st, 2023

Data at GOR-1:

Item	Weight in KGs	Rate Per KG (Rs)	Amount in Rs
Shopper	150	13	1950
Plastic	65	70	4550
Paper/ cardboard	210	20	4,200
Glass	54	5	270
Cloth	575	5	2875
Shoes	25	5	125
Tetra Pack	164.4		Not Sale
Thermophore	30	110	3300
Total	**1273.4**		**17,270**

Waste Data at Moon Market:

Item	Weight in KGs	Rate	Amount in Rs
Shopper	54	10	540
Plastic	0	0	0
Paper/ cardboard	12		Not Sale
Glass	0	0	0
Cloth	354	5	1770
Shoes	0		0
Tetra Pack	0		0
Thermophore(Cat -1)	60	110	6,600
Thermophore(Cat -2)	34	80	2720
Total	**514**		**11,630**

AHKMT conduct training for LWMC workers

Dr Akhter Hameed Khan Memorial Trust (AHKMT) conducted two-day training for staff of Lahore Waste Management Company on solid waste management from 14-15 September 2023 at Shaheen Complex at Egerton Road, Lahore. AHKMT has worked with Lahore Waste Management Company on various prospects to identify and explore various options of waste recovery as resource. This was done under an MOU with the sole purpose of exploring various ways to convert waste into resource.

During the two-day training the staff was briefed about Dr Akhtar Hameed Khan Memorial Trust, e- guard, their working. The trainees were apprised about what waste is. The main objective was to facilitate LWMC staff who had conducted study with AHKMT to acquire the skilful and knowledgeable human resources and meet their future demand. A team from Al-Akhuwat Mustafaabad was specially invited as observers to join the training.

The training covered not only the technical aspects of solid waste management from generation to disposal but its management and social aspects as well. They were also apprised about resource recovery including income generation ideas and how products could be produced from waste.

The trainees during the first day of the training were also taught what compost is and how its value addition and marketing can be done.

On the second day of the training experts from AHKMT delivered their lecturers of their respective expertise and replied to queries put up by the LWMC staff. Meanwhile chief executive officers of e-guard and Console Enterprise, two companies dealing with solid waste also shared their experiences with LWMC staffers. The LWMC was taught about services related to solid waste management including waste collection, segregation, organic waste transportation and how waste can be recycled.

Dr Ghulam Jeelani, soil expert from Pir Mehr Ali Shah Arid Agricultural University Rawalpindi also shared his experience and importance of soil requirement for compost and value addition in compost.

Dr Kamran, GM Projects and Planning and GM Operations Rashid Zahoor represented LWMC at the training sessions. Reiterating his commitment of turning solid waste management into a success story, Director General Punjab Katchi Abadis Hafiz Rashid Mehmood delivered his thoughts on the public participation theory of Dr Akhtar Hameed Khan sab and its needs& impotence for the community development.

Besides imparting knowledge about solid waste on the LWMC staff, they were also told about how to maintain personal hygiene while collecting and segregating solid waste.
They were also told about Integrated Resource Recovery Center (IRRC) model and how it works. They were told about its need, importance, design, construction, operations and supervisory role.

AHKMT intervention with LWMC including segregation, storage and sale of recyclables was also discussed. The study findings of waste stakeholders were also discussed. At the end of the training certificates were distributed among the participants.

Finding solutions for solid waste management in Afghan refugee village through UNICEF assistance

Solid waste management (SWM) has gained recognition as a crucial infrastructure that must be provided everywhere, just like freshwater, power, and telecommunications. Municipal waste is produced from the houses or trade provisions and services everywhere around the globe irrespective of uptown localities of shanty towns.

Solid wastes are now a common sight in all major towns and cities of Pakistan. It is now without question that unprocessed solid waste is a significant challenge for our cities and towns. As a result, urban and rural people frequently have to deal with the danger to their overall health and safety.

Dr Akhtar Hameed Khan Memorial Trust signed a Memorandum of Understanding with District Administrator Afghan Refugees for establishing a 3 tons' capacity Integrated Resource Recovery Centre at Pinian-2 in Haripur district. It will also create job opportunities for 13 Afghan refugees or local community members. AHKMT will provide technical assistance for successful running the IRRC for two years after establishment of the facility of CAR KP. The IRRC will be established with financial assistance from UNICEF. AHKMT will train the selected staff for the IRRC as per requirement

Earlier, Dr Akhtar Hameed Khan Memorial Trust in collaboration with UNICEF, Commissionarate of Afghan Refugees, and Haripur District Government conducted Solid Waste Characterization Study at an Afghan Refugee Village in Haripur district of Khyber Pakhtunkhwa in June 2023.

The solid waste characterization study was conducted by AHKMT at Afghan Refugee Camp in Village Pinian-2 in Haripur district. The area lacks a proper solid waste management mechanism which is not only affecting the beauty of the surroundings, but is also creating health hazards for local people. This study assesses the composition of solid waste generated and provides suggestions for improved solid waste management by establishing Integrated Resource Recovery Centre in Pinian-2.

Study Area:

Panian-2 is one of the Afghan Refugees villages present in Haripur district and the population of Panian 2 is about 23,000. Usually people throw the waste on points where every year the lake water reaches and stays for around 3 months. Moreover, this waste is a cause of land degradation, polluting drinking water and adding pollution in to Tarbela lake water.

Methodology:

The methodology of the study covered interaction with relevant departments, visits to various areas to select target samples, developing tools and arranging the required materials for the study. The study sampled 100 Households (HHs) and 25 shops where socio economic survey was undertaken with all the targeted HHs. A systematic mechanism was developed and followed for waste collection and characterization for seven consecutive days for targeted 100 HHs.

Tools

The Waste Wise Cities tools (developed by UNHABITAT) were adopted for conducting the study.

Major Findings:

The study identified options for improvement of solid waste management system in Afghan Refugees Village Panian 2 through recycling to reduce the impact of waste on the environment and public health.

Description	Numbers
Total HHs	100
Total Population	1254
Average family size	12.5
Average monthly expense per HH	54505
Average patient per family for last 2 months	1.4
Average expenses per HH on medical	26555
Total medical expenses in last two months for 100 HH	419950
Average SWM Charges (included in Water bill)	PKR. 100
HH have sweeping facility for streets	100

Tool Name	Use of the Tool
Survey form for solid waste HHs	This tool gathers information regarding target HHs as relevant to solid waste and its impact on health, general expenses and other elements.
HHs survey analysis form	This tool creates the summary analysis of HHs survey.
Survey form for commercial units	This tool gathers information regarding target shops relevant to solid waste.
Analysis form commercial units survey	This tool creates summary analysis of shops surveyed.
Questionnaire for SWM line department	This tool gathers the details of SWM in the target city by relevant line department.
Questionnaire for scavengers, sanitary workers	This tool gathers information about stakeholders and informal sector who were working in solid waste business.
Questionnaire for scrap dealers	This tool gathers information about scrap dealers who were working on solid waste business.
Recording sheet HHs daily waste	This tool records the weight of waste collected from each of the 100 HHs.
Recording sheet of daily waste collection from shops	This tool records the weight of each of the 30 shops on collecting waste.
Recording sheet for domestic waste composition analysis	This sheet records the weight of each type of waste of total of 100 HHs after segregation and analyses.
Recording sheet for commercial waste composition analysis	This sheet records the weight of each type of waste of a total of 25 shops after segregation and analyses.
Evaluation of study by HHs	This tool gets the feedback of HHs regarding study.

What is the waste?

Organic waste included kitchen and garden waste items, animal waste and ash; dry/ recyclable items included paper/cardboard, cloth, shoes, metals, tetra packs, women hair, glass and reject included diaper, ceramics, building materials, dust. The report calculated the results as per received waste from the samples.

Socio-Economic Survey findings:

In order to understand the solid waste situation in Panian 2, the study team conducted socio-economic survey of the area as well. The survey covered many factors like population, monthly expenses, waste disposal methods, medical expenses and number of patients in last two months. It was found that the majority of the people in the selected HHs were residing in the locality for more than 30 years. It was also found that the total number of householders in the selected HHs was 1254.

Impact of lack of SWM System in Panian 2

Absence of a proper solid waste management system impacted the health of the target community. While conducting the survey the team also asked questions with regard to health of family members and the amount spent on curing illnesses. The average number of patients in the selected HHs was found to be 1.4 and it was found that in the last two months total 141 out of 1254 persons fell became sick and the average medical expenditure per family was **PKR. 26555**/-.

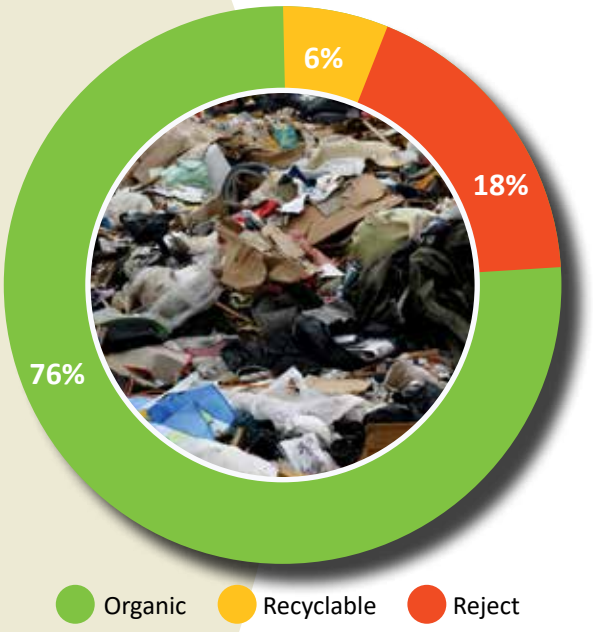
Waste quantity per family

The study showed that the average family in Panian-2 produced 8 kg of solid waste daily, comprising organic material (75%), recyclable material (6.15%), and unusable residual material (18%). Total domestic solid waste generated in Panian-2 was about 14.7 tons per day where one person produced 0.64 Kg waste a day. Here the portion of ash and dust collected from courtyard sweeping made a significant contribution in increasing the weight of the solid waste.

Domestic waste composition:

Day	Total	% age of waste in total
# of HH waste collected	649	
Organic		
Kitchen and Garden	2570.85	49.59
Animal waste	271.29	5.2
Ash	1075.53	20.7
Sub- total	**3917.67**	**75.49**
Dry/ Recyclable		
Hard Plastic	21.19	0.4
Soft Plastic	6.82	0.11
Shopper	132.06	2.54
Paper/Cardboard	21.71	0.4
Glass	66.13	1.2
Metal	6.45	0.11
Tetra Pack	4.83	0.07
Cloth	54.65	1
Shoes	8.31	0.15
Bone	9.44	0.17
Hair	0.27	0
Sub- total	**171.79**	**6.15**
Reject	**934.96**	**18**
Total	**5184.22**	

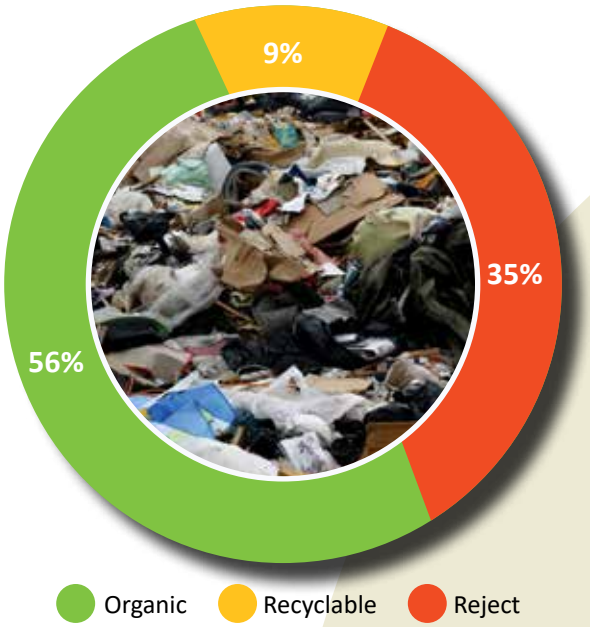
Figure 1- Composition of Domestic Waste



Commercial waste composition

Day	Total	% age of waste in total
# of shops	**40**	
Organic		
Kitchen and Garden	11.46	8.5
Dry/ Recyclable		
Hard Plastic	1.15	0.78
Shopper	16.64	12
Paper/Cardboard	3.4	2.3
Glass	19.11	14
Metal	0.35	0
Tetra Pack	1.17	0.78
Cloth	6.7	4.6
Reject	68.84	56
Total	**128.82**	

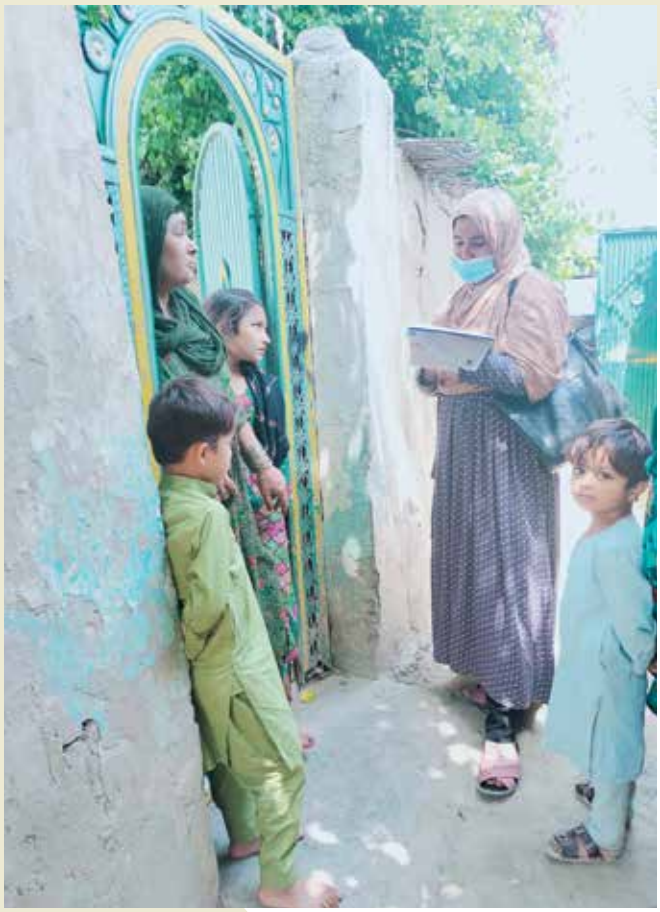
Figure 2- Composition of Commercial Waste



Calculation of domestic waste in Panian 2

Total domestic solid waste generated in Panian-2 was about 14.7 tons per day where a family produced 8 Kg waste and one person produced 0.64 Kg waste a day.

Description	Qty
92 average families produced waste (in Kgs) for 7 days	5184
Average waste (in Kg) produced per family per day	8
Average family size	12.5
One person produce (in Kg) waste a day	0.64
Total population of Panian 2	25000
Total waste (in tons)produced in Panian 2	14.7
Organic Waste Produced (in tons) per day	11
Recyclable waste (in tons)produced per day	0.8
Reject waste (in tons)produced per day	2.3



Climate impact

There were other findings and observations of the study team during the study that the average size of one family (eat from one kitchen) reaches above 12. The families involved young kids for throwing waste at dumping points and fields and floods hits the area during monsoon the waste washes into the Tarbela Dam causing environmental calamities.

Needs of IRRC

The quantity of organic waste was found very high which justifies to establish IRRC which will improve solid waste management in target community and will help to make the water reservoir better as currently the waste is going in Tarbela lake.

Effective management of solid waste is critical for public health, safety, sustainability of natural resources and protection of the environment. Proper integrated solid waste management system can contribute towards the achievement of the Sustainable Development Goals Agenda 2030 - Goal # 11: 'Sustainable Cities and Communities' and SDG 12: 'Responsible Consumption and Production'. It can also contribute to government's efforts for a clean and green Pakistan.

Recommendations:

Construction of Integrated Resource Recovery Centres (IRRC)

AHKMT had recommended to construct IRRC of three tons daily green waste capacity initially which would be later expanded later to five tons' capacity for the area. A three tons' capacity IRRC will produce 300 Kgs organic compost daily of price PKR. 6000/-. The study data reflected that there is a high organic waste quantity including kitchen waste, ash and animal waste in the target area.

IRRC is the best suggested solution to protect the land from degradation. The organic portion of the waste is converted into compost for self- sustainability. The cost in shape of community health and environment is also very high.
In the HHs survey, it had been found that on average each HH spends PKR. 13000/-per month on medical needs. A clean healthy and hygienic environment due to efficient SWM will reduce the number of diseases.

AHKMT developed successful sustainable models of IRRCs in Islamabad and Mardan. These IRRCs initially required capital cost for construction and are now self-sustainable ever since. IRRC Mardan is producing 500 kg compost daily out of 5 tons of green waste. The IRRC established at B-17 Islamabad is also self-sustained having 3-ton green waste capacity.

Here AHKMT suggested to charge fee each family against the waste collection services. These charges would be determined involving local community leaders. Moreover, the revenue generated by selling recyclables would also help to sustain the IRRC.

AHKMT has also planned to initiate later vermicomposting and Black Soldier Flies units at IRRC which would help to generate revenue for the sustainability of IRRC model.

Social Feasibility Model (Integrated Resource Recovery Centre) need of the hour

Dr Akhtar Hameed Khan Memorial Trust conducted a Social Feasibility Model (Integrated Resource Recovery Centre) for Afghan Refugee Village in Panian 2 Haripur, as well in June 2023 to design a model which could be suitable for specific target community of Afghan Refugee village, Panian 2.
The study involved the methodology of physical visits of the streets and target area to understand geographical dynamics of the area. Moreover, the team lived along the community for around two weeks where they met the Afghan refugee families, interacted with local community leaders (Maliks) to understand the general norms, culture and behaviors of the local community especially focusing on their solid waste management practices. The team conducted a socio economic survey of around 100 households which also reflected in few social aspects like average number of families in the target community. The study focused on the few key questions which will help design the model suitable for target community.

In the study the team dwelt upon following queries:

- **Do the circumstances and situations of the area demand for the intervention?**
- **Which approach will work to implement the project?**
- **Do the intended beneficiaries want the service of waste collection?**
- **What are the possibilities for sustainability of the model in future?**
- **What would be possible challenges and hurdles in the model?**

GOAL OF THE FEASIBILITY STUDY

The aim of the feasibility study is to identify whether and in what manner social aspects can be integrated into IRRC model to establish efficient solid waste management system in Panian 2. The feasibility study will help to understand the local practices, possible options to work with the target communities and lead towards the sustainability of the model.

- The technical experts of AHKMT conducted five visits of Afghan Refugee village Panian 2 and surrounding population. They conducted various types of activities including physical visit of all streets of Panian 2, meeting with stakeholders, assessment of the locations/ sites proposed for construction of IRRC.
- The team also made some observations of general practices relevant to solid waste management.
- The technical experts got the google map coordinates of IRRC proposed site and corner locations north, south and east to make a map of target community.
- AHKMT experts interacted with various layers of local community representatives including capital leaders (Maliks) who had influence on large community and sub- leaders including mohallah wise leaders who were also called mohallah Maliks.
- Interviews were conducted with different people including scavengers, scrap dealers linked with solid waste recyclable items purchase and sale.
- A survey was conducted in Haripur city nurseries to find out the demand for compost sale at these nurseries.

- A socio-economic survey was conducted to find out some basic information about the average number of members per family, general monthly expenditures of a family and expenses made on the cure of diseases. Moreover, the survey also found out if the families used dustbins, where do they throw their garbage in routine.

RESULTS AGAINST KEY QUESTIONS:

Do the circumstances and situations of the area demand for the intervention?

- It had been observed during the study that heaps of solid waste were found along the roads that had been turned into dumping points by the local community. All the waste and plastic goes to Tarbela Lake. Every year during the month of July the water of Lake reaches at this dumping point.
- We also found that young children boys and girls had been involved to throw waste on some specific points in Panian 2. In most of the cases the weight of the waste was more than the physical abilities of children.
- Some items of recyclables including shoppers (plastic) and cloth was not being purchased from domestic and commercial areas. This shopper was used for burning fire in furnace and mud oven at domestic side while shopkeepers too burn this waste. Moreover, still a large quantity of shopper reached the dumping points.

Which approach will work to implement the project?

- We suggest to involve local community leaders/ heads of target community in the project. We will formulate a committee for this project which will facilitate the social involvement. This was observed during the study that the local community leaders (Maliks) had a visible influence in the community as during survey when the team asked about the service charges or payment mechanism, against the primary collection service in future, the families replied that they will pay as per Malik's decisions.

Do the intended beneficiaries want the service of waste collection?

- The team conducted survey in target HHs of waste characterization study and 100% HHs were in favor of waste collection service. They said that it will make the area clean as currently they threw waste in nearby fields and plots.

What are the possibilities for financial sustainability of the model in future?

The quantity of green waste in Panian 2 is about 75% which is a positive sign to establish IRRC for production of compost. During the survey of 100 HHs, AHKMT found that 67% families are willing to pay while the 33% remaining families are not willing to pay, however, they said that they will pay as per Malik's decision. AHKMT further will involve innovations of wormy compost and black soldier flies for revenue generation of IRRC. There is sufficient quantity of animal's waste in Panian 2 which will help to produce wormy compost and enrich compost as well.

There is a local team available for managerial and other labor works for IRRC, AHKMT identified and worked with such persons during waste characterization study.land is available for products development in the target community and surroundings.

Possible Challenges	Mitigation Plan
There is possibility that the community leaders (Maliks) themselves will not be in favour to pay service charges by families against the service of primary waste collection from households/ families for six days a week.	AHKMT will get involve the Afghan Commissionarate office present at district level to mobilize the Maliks. The purpose of the committee formation is to get support of Maliks to remove the bottle necks.
It had been found that few families were poor and they may not able to pay service charges.	The project will give them compensation with involvement of Maliks.

What would be possible challenges and hurdles in the model?

ACTIVITIES OF SUGGESTED SOCIAL DESIGN OF THE MODEL:

The following design includes the proposed activities for the model of IRRC for Panian II, these activities are suggested in the result of social feasibility study conducted in the area:

Engaging with stakeholders and formation of project committee: AHKMT considers this as an important element to engage with the local community leaders (Maliks) along with other stakeholders like District Administrator Afghan Refugee Haripur for the purpose to make feasible the implementation of project activities in target village Panian II. This committee will meet on monthly basis where the progress of the project would be shared and support would be sought for removal of bottle necks.

Selection of beneficiary target households/ families: All families/ households would be selected from Panian II, this number is above 2500 as per AHKMT assessment. We will consider one household a family using one kitchen. It had been observed during initial survey that there were more than one families living behind one gate and they are using more than one kitchen. These households lie in camp 9, 10, 13, 14, 15, 19 and 20. We will include households/ families to complete the number of 3000 HHs from near rural population of UC/ VC Pindori which is situated on the west of this village. Currently, the site selected for IRRC is in mid of the total target HHs.

Community Mobilization

AHKMT will hire a local team of male and female social mobilizers who will do mobilization with the target HHs/ families in the area of solid waste management, health and hygiene practices. The mobilization team will select volunteer lane managers who will further support the team for community mobilization and later for resource recovery (service charges). AHKMT would conduct a baseline survey of all target 3000 households to get the data base information of target families which will later help to make the decisions according the data.

Engaging Local Universities:

AHKMT will engage local universities including Hazara University and Pak-Austria Fachhochschule Institute of Applied Sciences and Technology Haripur for knowledge management and research of products at IRRC.

Engaging with Local Farmers and Nurseries:

The model will engage with stakeholders, farmers, nursery farmers and people linked with agriculture to initiate organic crops and products using compost of IRRC.

Initial Environment Examination (IEE), Flood and other Studies of IRRC Proposed Sites: Prior to start the construction of IRRC, few studies of the sites are mandatory so that IRRC have to be at safe place and there is no possibility of creating any hazard for the IRRC unit or the communities living around.

Design and Construction of IRRC Plant:

It includes developing design, layout, BoQs for IRRC and construction work.

Establishing Waste Collection System:

AHKMT would design waste collection system which will cover the routes of waste transportation, vehicles types used for waste collection and transportation and division of streets according to the vehicles specifications.

Establishing Resource Recovery:

Initially there would be three resource generation streams including first sale of recyclables, second sale of compost and third fee collection (service charges) from HHs. It has been suggested that local community leaders (Maliks) will mobilize the HHs/ families for fee (service charges) payment.

Operations of IRRC:

Primary waste collection, transportation at IRRC, segregation and compost producing process are the operations of IRRC.

Innovations and Products Development for Model Sustainability:

AHKMT would involve few innovations like producing wormy compost out of animal's waste which is available in sufficient quantity in the target community. Moreover, Black Soldier Flies innovation would also be implemented which do not require a huge investment rather these will contribute in revenue generation and sustainability of the IRRC. Some products would be initiated later as IRRC starts operations like shopper is not being purchased by scrape dealers/ vendors of recyclables so AHKMT plans to initiate producing slates out of shoppers and some plastic items which are not being purchased from households and market.

Marketing:

Marketing of IRRC products is an eminent planned activity for that AHKMT has a plan to get the nursery farmers on board for sale of compost on their nursery farms. Further the marketing will cover mobilization of farmers/ peasants for growing organic vegetables, crops and fruits and sale of organic products.

A bold initiative by district administration to give land to Anmol for setting up IRRC in Attock

Solid waste production is one of the biggest challenges not only for a developing country but also for the developed world. In Pakistan, about 48 million tons of solid waste is produced annually, and at a rate of is increasing more than two percent every year. This is the waste that we are throwing or littering on roads, streets, and buildings, and are giving to waste collectors and vendors. Vendors collect and throw it in open dumps. It is recycled, segregated, reduced or reused, or. Yet, most Pakistanis appear unconcerned. While garbage collection does occasionally appear on the national agenda in the context of governance failure, recycling or environmentally sustainable solid waste management is almost never discussed.

E-Guard and AHKMT have several successful ventures in different parts of the country including Islamabad, Sindh and Khyber Pakhtunkhwa on its resume.

In Islamabad alone, e-Guard and AHKMT have established IRRCs at Jammu & Kashmir Cooperative Housing Society (JKCHS) in Sector G-15, FECHS-Jinnah Garden, F-17 (MPCHS) B-17 Islamabad.

Keeping in view our success in the field, former minister for climate change Malik Amin Aslam visited our IRRC in Sector G-15 and he was quite impressed with the IRRC model. He also wanted to replicate the model in his constituency and invited Dr Akhter Hameed Khan Memorial Trust to visit his area. A team of AHKMT led by CEO Sumaira Gul visited the area briefed Deputy Commissioner Attock on which AC Hazro Maleeha showed interest in replicating the model in Hazro district Attock.

AC Maleeha assigned this task to TMA engineer Sadaf to take up the task who with the help of AHKMT prepared the initial design and assessment of the project. Meanwhile, a local welfare society Anmol also showed eagerness to replicate this model as well.

Majority of the locals are living in United Kingdom and although the locals have evolved a system of keeping their villages clean, but they lack a proper waste disposal system therefore they are eager to replicate this model in their areas because of its dual advantages. First of all, it will reduce the solid waste and also produce organic compost. As most of the people are farmers, they can use this compost in their farms.

But unfortunately, the end of government in Khyber Pakhtunkhwa dealt a serious blow to this project. AC Maleeha was transferred and patron of the local welfare society was also against the project. So the project could not see the light of the day.

However, this year Dr. Naveed Cheema, a close friend and our guide talked to new DC Attock Atif Raza and he was briefed about the IRRC. He decided to set up two IRRCs in Attock and Hazro.

He along with Anmol Welfare Society laid foundation stone of IRRC in Hazro on August 31, 2023. JV, e-guard and Console CEO Shahzad Ahmed Tahir signed a memorandum of understanding for technical assistance in presence of DC Attock. The construction work on the project has already begun and it will be completed by the end of the year. The IRRC will be operational next year.

IRRC in Kasur

Social Mobilization Team of Akuwat Project, Dr Akhtar Hameed Khan Memorial Trust and e-guard and JV Console signed a memorandum of understanding for establishment of Integrated Resource Recovery Centre (IRRC) in Mustafabad in Kasur. AHKMT team was given responsibility of social mobilization, capacity building the operationalization team of IRRC.

Social Mobilization Team Training

A team of Akhuwat was constituted which comprised two females and 3 males and their two- day training was conducted. On the first day of the training, the trainees were told about form making for data collection, household numbering and how to take volunteers from local community, lane marking and other tools.

On the second day of the training the team was taught how they will conduct the surveys of 20 to 25 households. Later their collected data was analyzed at the office and they were taught how it is done. A Whatsapp group was formed in which daily work would be shared. The team was given a task they should conduct daily work on 25 households and conduct a meeting of 50 households and prepare a progress report. It was planned that after completing survey of 1500 households in one month. Later Mr Hamid Ullah joined the community meeting for training of lane members.

Although Dr Akhtar Hameed Khan Memorial Trust conducted a waste characterization study in district Kasur Punjab in 2022 after Dr Naveed Cheema of SNG, a project of Oxford Policy Management in Pakistan visited Integrated Resource

Recovery Centre in B-17, Islamabad. AHKMT strived hard to get an IRRC established in District Kasur, but several hiccups surfaced up which stalled the entire process that year. However, luckily Console CEO during a ceremony in Faisalabad gave a briefing on IRRC and the participants invited them to meet Akhuwat head Dr Amjad Saqib who in a meeting shown eagerness to start an IRRC in Mustafabad area of Kasur. All the terms and conditions were set in place for the project and an IRRC for 500 households was to be established in the area. The local administration also handed over a government owned land for the project. But unfortunately some locals intervened and stalled the project by getting a stay order against it from court.

However, Dr Amjad Saqib and Deputy commissioner Kasur laid foundation stone of the project on September 21, 2023. They had made the locals who interrupted the establishment of the project realized that the project will be beneficial for the whole area and it will also provide jobs to the locals besides providing cleanliness services in the area. They were also told that the IRRC will also produce organic compost that will be used in the farms.

JV, Console and e-guard have been given role of providing technical assistance for the project.

Khairpur visit for establishing IRRC

A team from Dr Akhtar Hameed Khan Memorial Trust visited BBSUSTD Khaipur Mirs , Sindh for establishment of an integrated Resource Recovery Centre in the locality on September 26, 2023 to raise awareness and seek technical consultation on establishing Solid Waste Management center in Khairpur Mirs.

Meeting at Technical University Khairpur

Ms Sumaira Gul, CEO AHKMT presented IRRC model to effectively utilize solid waste in organic compost for cultivation of agricultural land.

Prof Rasool Bux Mahar, VC BBSUTSD welcome all the guests and appreciated the concept of IRRC for solid waste management and ensured technical assistance required by AHKMT for this project from the university.

the AHKMT team met Technical University Khairpur Vice Chancellor Mir Bakhsh. Representatives from Municipal Committee Khairpur and technical experts for IRRC were present in the meeting. The participants were given a detailed briefing on IRRC by the AHKMT team during the meeting. it was decided in the meeting that in order to dispose of solid waste in their area, everybody will have to play their part respectively and positively in which the university will provide technical team engineers, students will be utilized for community work and mobilization while the MC will provide land for setting up the IRRC, while AHKMT will play its part in designing the IRRC and provide technical assistance for social feasibility design.
After the meeting the teams visited MC Mirpur.

Meeting at Municipal Committee Office

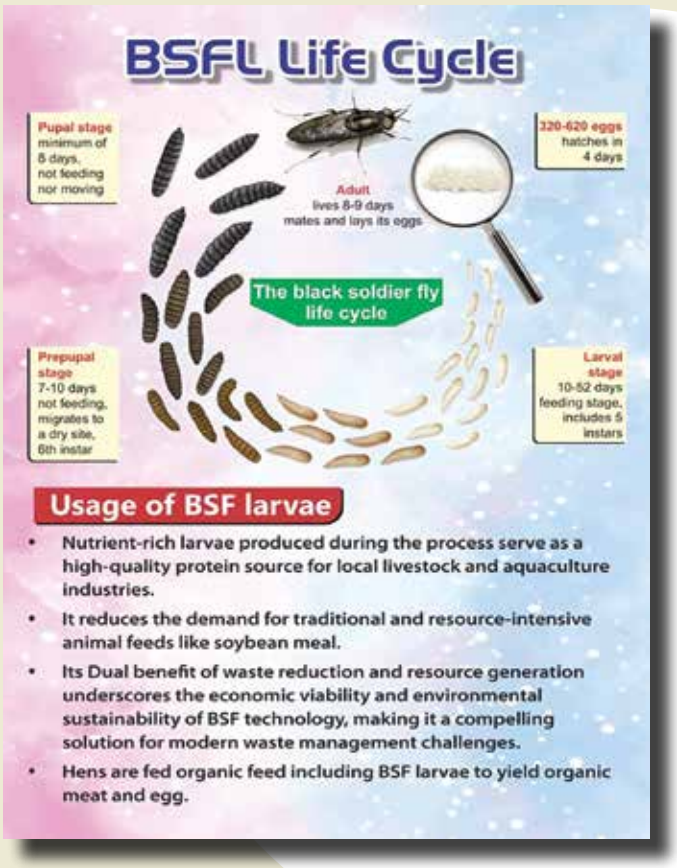
Zulfiqar Ali Bhutto, Chief Municipal Officer appreciated the concept of IRRC and ensured the support required by AHKMT for this project.

Ms Sumaira Gul appreciated the efforts of Prof Dr Rasul Bux Mahar and Zulfiqar Ali Bhutto for extending their cooperation for the project. The consultation meeting was also attended by Muhammad Juman Sial, Member Municipal Corporation, senior faculty members and officials of the university including MC Vice Chairman Munir Hussain Mangi, Councilors Babu Pathan, CMP, Dr Ehsan Asif, Rais Mazhar Phalphoto, Arif Lal, Syed Azhar.

They discussed in detail the proposed three spots of lands and ideas for establishment of IRRC. Later the MC Staff took AHKMT team to different lands for selection process of land. The AHKMT team identified and selected the land near Water Disposal for establishment of IRRC.

Black Soldier Fly—A promising Innovative Solution for Solid Waste Management in Pakistan

Solid waste management is a pressing issue in Pakistan, characterized by a rapidly growing population and inadequate waste disposal infrastructure. The country generates substantial quantities of municipal solid waste



BSF reduces climate change impact

BSF innovation has a high potential to cope with the current challenges related to inadequate reliable waste management infrastructure as Pakistan has favourable environmental and climate conditions. It is also capable of fostering regional growth, creating jobs, and local recycling of degradable waste. Dr Akhtar Hameed Khan Memorial Trust conducted a study and established a designated set up for BSF farming, which has proved quite successful.

Black Soldier Flies (BSF), scientifically known as Hermetia illucens, are a species of beneficial insects that play a vital role in organic waste decomposition and nutrient recycling. BSF have gained attention as a potential solution for solid waste management in various parts of the world, including Pakistan.

(MSW), estimated at 2.4% annual growth, with individual daily production ranging from 0.283 to 0.612 kg per capita. This escalating waste generation has far-reaching environmental and health consequences. The prevailing methods of waste disposal in Pakistan include composting, land filling, open dumping, incineration, and anaerobic digestion, all of which have proven to be neither ecologically sustainable nor cost-effective. These practices, if left unaddressed, have the potential to contaminate the air, water, and soil, posing grave health risks to the populace. Consequently, there is an urgent need for innovative and sustainable solutions, such as the adoption of technologies like BSF larvae, to transform Pakistan's solid waste management landscape and alleviate its associated socio-environmental burdens.

The environmental and economic benefits of Black Soldier Fly (BSF) technology are indeed substantial. BSF larvae digest green waste thus reducing the causes of production of methane gas reducing the climatic impact of solid waste. For instance, in a case study conducted in a densely populated urban area of Islamabad, BSF larvae were able to efficiently process several tons of organic waste per day, diverting it from landfills and significantly reducing the burden on waste disposal sites. This not only mitigated the release of harmful methane emissions and prevented groundwater contamination associated with landfilling but also reduced the carbon footprint of waste management. Moreover, the nutrient-rich larvae produced during the process serve as a high-quality protein source for local livestock and aquaculture industries, reducing the demand for traditional and resource-intensive animal feeds like soybean meal. This dual benefit of waste reduction and resource generation underscores the economic viability and environmental sustainability of BSF technology, making it a compelling solution for modern waste management challenges.

Dr Akhter Hameed Khan Memorial Trust was joined by Dr. Muhammad Nasir, PhD Entomologist (Beneficial Insect Management Expert), for conducting a study and establishing a designated set up for BSF farming, which has proved quite successful.

Earlier, Dr. Akhter Hameed Khan Memorial Trust and Engro Foundation launched a pilot project, a physical facility of solid waste management for solid waste collection, organic and plastic segregation and processing in union Council Kot Hathyal Bhara Kahu, Islamabad. The project was planned to include Black Soldier Flies (BSF) component with other components of the project. AHKMT conducted BSF market assessment in Tumair, BharaKahu and Charrah and the results were outstanding.

The study offered a simple assessment of the black soldier fly larvae market concerning prior knowledge, use, and future demand. It quantified the market demand for BSF products in farmed animals especially poultry by assessing current demand for feed products that are similar and therefore could be substituted by BSF products.

During the study it was found that in this area poultry feed market is very high as the fish feed market is almost non-existent because in this area there are no fish farms. Secondly the farmers of fish generally use cow dung and poultry waste to feed the fish. Poultry Feed producer's/mills response remained very encouraging which showed that there is high demand of BSFL in poultry feed production. The study suggested few recommendations and initiatives

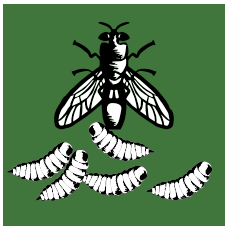
for BSF on the basis of the findings and market assessment. A pilot of BSF farming in Islamabad is deemed to be important that could help BSF marketing, as per discussion with feed mills and other stakeholders like retailers and even the farmers, all wanted to have a model which could describe the results, two feed mill production experts demanded that AHKMT should provide one-kilogram dry larvae so that the feed mills conduct an analysis of BSF larva prior to deciding on it.

The large-scale production of BSF larvae is in great market demand, as indicated by one of the survey respondents during visit to Islamabad Feed Mill, who expressed the need for a daily supply of 20 tons of protein components. Additionally, the respondent from Markaz Feed Mill, highlighted that BSF larvae are considered a superior protein source compared to soybean.

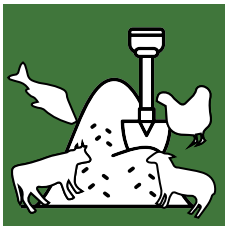
BSF are not only efficient at consuming organic waste but also have several other advantages that make them a promising option for the future of solid waste management in Pakistan. These advantages include:

Efficient Organic Waste Processors: BSF larvae can consume a wide range of organic waste materials, including kitchen scraps, agricultural waste, and food processing by-products. This helps in diverting organic waste from landfills, reducing the burden on waste disposal sites.

Rapid Decomposition: BSF larvae are known for their rapid consumption of organic matter. They can significantly reduce the volume and weight of waste within a short period of time, accelerating the decomposition process.



Nutrient-Rich Larvae and Frass: The larvae themselves are a valuable resource. When harvested, they can be used as a protein-rich feed source for livestock and aquaculture, reducing the demand for traditional animal feed.



Additionally, the residue produced by the larvae, known as frass, is rich in nutrients and can be used as a natural fertilizer.

Reduction of Environmental Pollution: By diverting organic waste from landfills, black soldier flies help mitigate environmental issues associated with land filling, such as methane emissions and groundwater contamination.

Low Environmental Impact: BSF farming has a relatively low environmental footprint compared to other waste management methods. They require minimal water and space, making them suitable for urban environments.

Economic Opportunities: The cultivation and processing of black soldier flies can create economic opportunities for local communities. It can generate employment and provide a sustainable source of income.

However, for BSF to become a significant part of solid waste management in Pakistan, several challenges and considerations need to be addressed:

Regulatory Framework: Pakistan would need to develop regulations and guidelines for the rearing and use of BSF in waste management to ensure safety, quality, and environmental compliance.

Public Awareness: Raising public awareness about the benefits of BSF-based waste management and promoting community participation in waste reduction efforts is crucial. Infrastructure and Technology: Investments in infrastructure and technology are required for the large-scale adoption of BSF farming and waste processing facilities.

Research and Development: Ongoing research and development efforts are necessary to optimize the black soldier fly rearing process, develop efficient waste collection systems, and explore new applications for the resulting larvae and frass.

Although, black soldier flies offer a promising solution for solid waste management in Pakistan. However, their successful integration into waste management systems will depend on effective policies, infrastructure development, public support, and ongoing research and innovation in the field.

Black Soldier Flies Larva Market Assessment Study

Dr. Akhter Hameed Khan Memorial Trust and Engro Foundation launched a pilot project, a physical facility of solid waste management for solid waste collection, organic and plastic segregation and processing in union Council Kot Hathyal Barakahu, Islamabad. The project planned to include Black Soldier Flies (BSF) component with other components of the project. AHKMT conducted BSF market assessment in surrounding area of Bhara Kahu.

The study offered a simple assessment of the black soldier fly larvae market concerning prior knowledge, use and future demand. This study was linked with IRRC Bhara Khau solid waste management pilot project so the geographical coverage of the data collection and sample is as accordingly. It quantified the market demand for BSF products in farmed animals especially poultry by assessing current demand for feed products that are similar and therefore could be substituted by BSF products.

It has been found from the study that in this area poultry feed market is very high as the fish feed market is almost none because in this area there are not fish farms. Secondly the farmers of fish generally use cow dung and poultry waste to feed the fish. Poultry Feed producers and mills response is very encouraging which shows that there is high demand of BSFL in poultry feed production.

The study suggests few recommendations and initiatives for BSF on the basis of the findings and market assessment. A pilot of BSFL in Islamabad is important which will help BSFL marketing, as per discussion with feed mills and other stakeholders like retailers and even the farmers, all wants to have a model which describes the results, two feed mill production expert demanded that AHKMT to provide one kilogram dry larvae so that the feed mills conduct an analysis of BSF larva prior to decide for it.

BSF larvae production at scale has high demand as one of our respondent during survey in Islamabad Feed said that they need daily 20-ton protein component while the Markaz Feed respondent also said that this is better protein than soybean.

Objectives And Methodology

Objectives

The main objective of the study was to explore the market customer groups for the BSF products in areas near Bhara Kahu, to obtain more knowledge on the potential market size (amounts) as well as market value.

Specific objectives of the study are:

- Quantify the market demand for BSF products in farmed animals especially poultry by assessing current demand for feed products that are similar and therefore could be substituted by BSF products.
- Recommend marketing and sales strategies for BSF products for the different customer groups based on a comparison how the current feed products are currently being distributed and sold.

Methodology for data collection

Market segment

One main market segment was poultry (farmed animals), other animal groups have been identified that could be fed with BSF products.

The methodology used was structured around the following stakeholders involved in the supply chain of the animal feed

- Feed Producers: Companies who produce the feed products throughout in the target area.
- Feed Retailers: These companies or individuals (shop owners, etc.) sell the products directly to the end user.

- End-User: Are individuals (farmers) that buy products to feed to their animals.

Study Questions:
The following research questions were translated into tools with the aim to get response by sample persons during market assessment:

- If the poultry feed mills are ready to utilize BSF products in feed?
- If the feed retailers are aware about BSF products.
- What are potential substitutable products for BSF conversion products?

Based on the key points of interest we developed semi-open questionnaires including some few multiple choice questions. The questionnaires were split up in different sections:

- Respondent information: obtain personal information, such as the contact information, reason for starting the business (retailers), reasons why they are keeping these animals.
- Bestselling products, average prices: obtain information about the products that are sold by retailers or used by end-users. This helps identifying the products that may possibly be replaced by BSF products.
- Feed market size: obtain information from the respondent's quantity of feed sold/used.
- BSF products: information about the knowledge of interviewees on BSF products and their perception on these products.

Interviewed groups and locations
- Retailers: Interviewees were randomly selected at poultry feed markets,
- End-users: interviewees were selected randomly at farms located in Barakahu surrounding.

All surveys were conducted by face-to-face interviews.

Sample size
The survey sample size was as follows:
- Feed Producers: 5
- Retailers of Poultry feed:5
- End-users: 10

Farmers of layer chickens (for egg production):5
Farmers of broiler chickens (for meat production): 5

Poultry Feed Assessment
The study covered at feed producer's, retailers and farmers ends poultry feed names and prices in all two types layer chickens, broiler chickens.

Fish Feed Assessment
The study covered at feed of fish at fish department and retailers and prices.

Market demand for BSF substitution products
The study through survey with the feed producers, farmers as well as retailers identified the need of BSF products.

Study of BSFL studies and Tools Testing:
AHKMT team reviewed few BSFL market assessment studies prior to develop the study methodology. On 23rd November, 2022, AHKMT team met with institutions Poultry Research Institute and Dr. Nasir entomologist who is already working on BSF unit in Islamabad to get a better understanding of the strategy and tools prior to go for field survey

Results
AHKMT conducted survey for market assessment in focused area in surrounding of Barakahu, the end users/ farmers are selected from Tumair, Bhara Kahu and Charrah area, the feed producers are those three mills which are providing feed to above 95% farmers of poultry. The retailers have been taken from Barakahu and other surrounding area from where the farmers of Bhara Kahu and surrounding area get their feed.

Data Collection with Feed Producers

We got information by three feed producers who are producing feed near Islamabad and the feed of these producers is going to almost 95% farmers end users in our target area.

Data Collection by Poultry Feed Producers

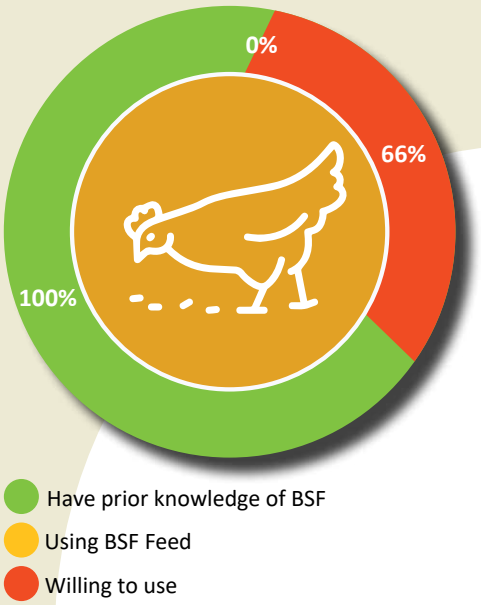


Figure-1 represents the response of poultry feed producers according to which 66% feed mill owners are ready to use BDFL in poultry feed, the study data shows that they are already familiar with the BSFL but not using it.

Meetings with
Dr. M Jhanzaib Arslan Production Manager Markaz Feed Mankiala Rawat:
Meeting with Dr. Mukhtar Naveed Production Manager Islamabad Feed Rawat:
Meeting with Dr. Gulraiz Ahmed General Manager Production Sb Sadiq Group of Companies:

S#	Description	Percentage
1	Grains (Maiz, Rice tips)	60 -70
2	Meals	20-30
3	Minerals and by products of chicken	10-15

Data Collection with Feed Retailers:

Meeting with

Punjab Feeds Rawalpindi: Mr. Adnan owner and Dr. Hashim Rana,a retailer of poultry feed namely Punjab Feeds where feed and medicines of poultry with other few products relevant to birds and poultry are sold. He shared that people use BSF larvae for fancy birds only. There we met the person who deals in sale purchase of poultry feed. He informed us that their daily sale is between2000 -2500 kg (40 to 50 bags and each bag weight is 50 kg).

Meeting with

Data Bird Shop Bhara Kahu: Mr. Sohail discussed, they brought BSF larvae feed few months ago few packs but still there is not much demand and they were not well familiar with BSF larvae because people here are not using it for birds or fish feed.

Data Collection by Poultry Feed Retailers

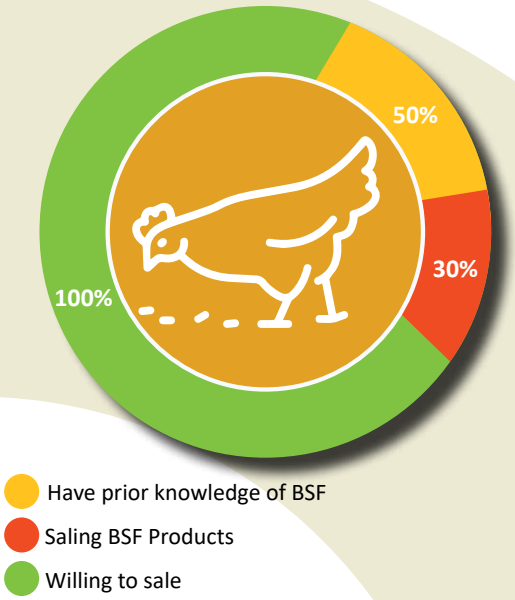


Figure-2 represents the response of poultry feed retailers according to which 50% retailers of poultry feed are familiar with BSFL, 30% are already selling BSFL while 100% are willing to sell BSFL if the rate is economical and results are good at birds.

Data Collection with End Users/ Farmers:

80% of the total farmers were not aware about BSF larvae and other products, they complained that the poultry feeds which are being provided in local area.

Type of Chicken rearing

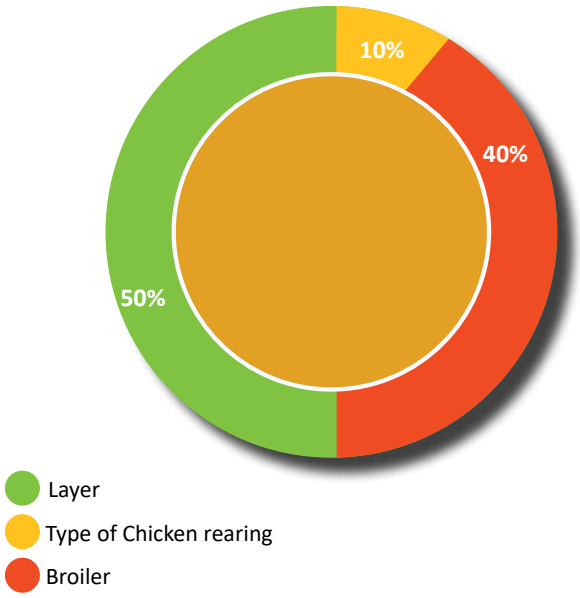


Figure-3 Response of End users of Poultry Feed/ Poultry Farmers

Data of End Users for BSF Products

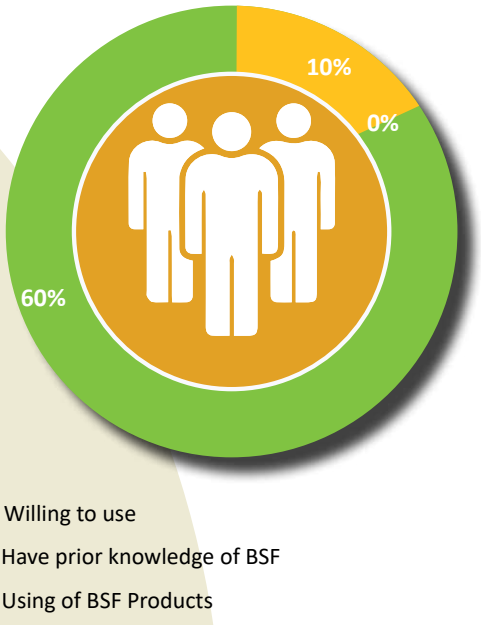


Figure-4 represents the response of end users/ farmers according to which 10% farmers of poultry are familiar with BSFL, while 60% are willing to use BSFL if the rate is economical and results are good at birds.

Data Collection with Poultry and Fish Feed Experts Institutions

Feed Test Laboratory Poultry Research Institute Govt. of Punjab: Director Poultry Research Institute and Dr. Ghulam Fareed Chemist of Poultry Research Institute Shamas Abad Rawalpindi discussed about the market assessment of BSF in 2021 and shared the following results.

Table BSFL analysis results

S#	Description	Percentage
1	Dry Matter DM %	94.9
2	Moisture	5.1
3	Crude Protein	47.25
4	Crude fat	6.2
5	Crude Fiber	15.5
6	Total Ash	12

National Agriculture Research Center (NARC) Poultry Department:

Dr. Fahim Baig supervisor poultry department at NARC shared that BSF larvae is good feed for poultry but currently in Pakistan it is not being used, its need to work hard to convince feed producer companies. He shared that maximum 18% protein and 5 to 10% soybean meal is included in poultry feed.

Fisheries Department Govt. of Punjab

Dr. Maria Latif at Rawal town Fisheries Department Govt. of Punjab briefed that currently BSF larvae was not being used for fish feed but it can be experienced and fisheries department can collaborate.

NARC Aquaculture Department:

Mr. Umair Khan is responsible to feed fish at NARC Aquaculture department, showed few species like Tilapia and two other fish which are kept in aquariums.

General Findings

- In this area poultry feed market is very high as the fish feed market is almost none because in this area there are not fish farms. Secondly the farmers of fish generally use cow dung and poultry waste to feed the fish.
- Poultry Feed producer's/ mills response is very encouraging which shows that there is high demand of BSFL in poultry feed production.
- As concerned the end users and feed retailers there is need of marketing of BSFL, as according to the data the farmer's/ end users and retailers of poultry feed are not well aware about BSFL.
- If the farmers would be briefed about the advantages of BSF larvae feed, then it may increase the demand at end user level.
- The retailers are also of the opinion and responded that marketing of BSF larvae can increase its demand.
- One retailer Punjab Feed is willing to do model of rearing birds on BSF larva, this is very encouraging and this would help to mobilize other stakeholders on evidence based results.
- Most of the farmers are not satisfied with the feed quality especially the mills present in surrounding of
- The composition of poultry feed varies at each producer end; this is highlighted by end users/ farmers as they told the names of few feed producers having low quality which is affecting bird rearing. The composition shared by one our feed producer is as follows:
- During the survey its has been find that rate of poultry feed per kilogram is between 120 to 135. The BSFL 50 gm pack rate is PKR. 200/- which reaches PKR. 4000/- approx. for one kilogram.
- The fish feed rate of the pack of 100 gm is PKR. 250 which mean PKR. 2500/- for one kilogram.

Recommendations

- The study suggests a pilot of BSFL in Islamabad which will help BSFL marketing on the basis of actual local production. As per discussion with feed mills and other stakeholders like retailers and even the farmers, all wants to have a model which describes the results, two feed mill production expert demanded that AHKMT to provide one kilogram dry larvae so that the feed mill conduct an analysis of BSF larva.
- BSF larvae production at scale is required as one of our respondent during survey in Islamabad Feed who is production unit incharge said that they need daily 20 tons' protein component.

BSFL Market Size

As per discussion with three poultry feed mills the demand of protein is near 50 tons in two poultry feed mills only and as per meeting with production experts they are willing to use BSFL as sensational protein component in feed after R&D.

Challenges

- Feed mills representatives do not share the information especially the composition of feed ingredients.
- The retailers of feed also do not share right information about the size of their sale and contacts of farmers etc.
- This subject area is new for most of the people so especially the farmers'/ end users take it a non serious discussion. It takes a time to bring them on serious discussion. At most farms the owners are not present, the employees do not share their contact numbers.

Value addition in compost

Although we have been preparing organic compost for over 8 years, but we have always felt the need of increasing its produce. Although we have been providing organic compost to 36 nurseries around Islamabad and they are successfully selling it and the result are good as far as plants are concerned. But as far as agriculture yield is concerned the results are not up to the mark. We have used organic compost for cultivation of cotton in 100 acres of land in Sakrand Sindh, wheat in 50 acres in Chakwal, Punjab and sugarcane in 2 acres in Mardan, Khyber Pakhtunkhwa and their result is satisfactory, but we have felt that the farmers want their yield as good as inorganic fertilizers which organic compost has not been able to produce.

However, this year we have achieved two things, one Prof Dr Ghulam Jeelani who had been a professor at University of Arid Agriculture Rawalpindi has joined our team for value addition in organic compost secondly NANBG has signed a memorandum of understanding with us and they will provide us microbes for value addition in compost.

So through these initiatives we are hopeful our compost will yield much better results in future.

We have also started registration process of our compost from Islamabad and Punjab that will be beneficial for IRRCs.

Earthworm

We met National Agriculture Research Centre's Dr Tariq Sultan who told us about their activity of preparing different kinds of compost. One of these is earthworm compost. Vermicomposting is the use of worms as a composting method to produce vermicompost.

They convert waste into worm manure (also known as worm castings), a nutrient-rich, biologically beneficial soil product. AHKMT and e-guard have started this experiment at one of its IRRCs and apart from a box it used a bottle with animal manure and put earthworms in it. These insects have converted the animal manure into compost in 4 to 6 months. We have also worked on nourishment of earthworms in a plastic bucket. We are proud to say that we have been able to produce quality vermicompost, which is quite costlier than the normal compost and many people have taken up the idea of using vermicompost in their orchards.

E-Guard Training Centre

To enlighten the state of the art in technology, organizational and legislative developments and practices as well as financial burdens and benefits of handling solid wastes, Dr Akhtar Hameed Khan memorial Trust has initiated work on its e-guard Training Centre that has been registered recently as a separate entity for training people about solid waste management. The need for the institute was felt that this should be a separate entity which should welcome the people interested in building their careers in field of solid waste where they should be taught courses on solid waste management developed by the team of AHKMT. The e-guard training centre is replication of a South Korean model IUTC international Urban Training Centre which was visited by AHKMT team in 2016.

Establishing of a training centre or an institute is pre-requisite for teaching the course therefore the need was felt to establish a separate institute for this purpose.

AHKMT is also trying Solid Waste Management course as trade registered with TTB (Trade Testing Board, Peshawar) and work on it is in progress.

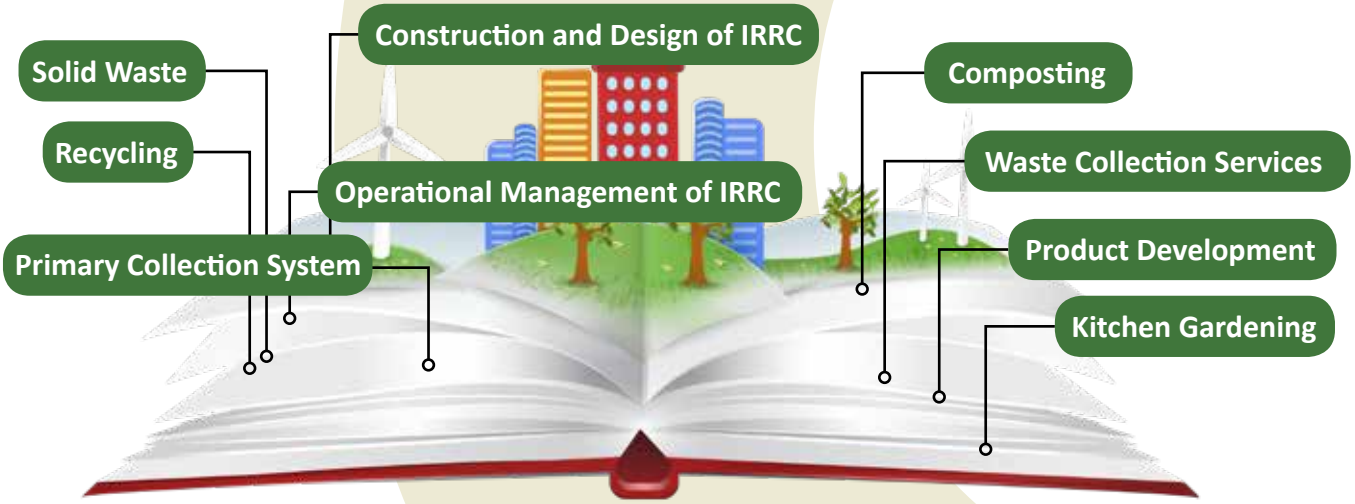
AHKMT also felt the need for students who have to visit the area from far flung areas and have accommodation hiccups. Therefore, AHKMT is building a hostel for students in the ETC to accommodate them.

The journey for e-guard in realizing the dream of a training centre is not a new one, it all began more than two decades ago when talk on climate changes started to creep up.

The project was initiated with an amount from TUGI Award and a plot for the centre was purchased. In order to meet the construction expenses, e-guard doled out funds from its own savings as well as selling it several assets including Suzuki pickups.

AHKMT also got e-Guard Training Centre registered with Securities and Exchange Commission of Pakistan. A special course for this centre has been prepared. At this training centre AHKMT wants to transfer the knowledge it has gained during past 20-30 years. AHKMT is upbeat to start first class at this training centre in 2025 because some formalities as far as registration as trade and construction are concerned remain.

As far as solid waste courses are concerned ETC will offer



IRRC Bhara Kahu: A dream that did not see light of the day

The rapid urbanization and economic development taking place in the Asia-Pacific region is leading to increasing solid waste generation, with an estimated 1.3 billion tons of municipal solid waste generated globally per year and this figure is expected to reach 2.2 billion tons per year in 2025. Managing solid waste is one of the costliest urban services in developing countries, where local governments spend 20 to 50 per cent of their budget on solid waste management. In low income countries like Pakistan, municipal solid waste management is the single largest budgetary expenditure, with on average 80 per cent being spent on collecting and transporting waste to the dumpsite. Despite the high spending on waste management, cities are finding it increasingly difficult to collect, process and dispose of solid waste in a cost effective and environmentally friendly manner. Open dumping is the most common method for final disposal of waste as it offers a quick and easy solution in the short run. However, this option is not sustainable in the long run as landfills reach capacity resulting from rapid waste generation rates and due to scarcity of land. Finding space for new landfills within municipal boundaries is becoming increasingly difficult. This problem is further compounded by the opposition of local communities to locate new landfills in their vicinity.

Moreover, open dumping causes severe environmental problems. Uncontrolled dumping leads to water and soil contamination, odors, and other health and hygiene problems. In addition to these adverse effects, uncontrolled dumping leads to the anaerobic decomposition of organic materials resulting in the release of methane, a powerful greenhouse gas (GHG), negatively impacting the climate. Improper waste management practices usually result in higher downstream costs than what it would cost to manage the waste properly in the first place.

In order to solve the problem, it is imperative to shift from the conventional end-of-the-pipe waste management system (focused merely on collection and disposal) towards a resource management approach. This approach can be bolstered by establishment Integrated Resource Recovery Centers (IRRCs), which are facilities that enable cities to turn waste into resources through composting, recycling and bio digestion, thereby diverting municipal solid waste from landfills or open dump sites. IRRCs typically processes 80-90% of waste streams, in proximity to the source of generation, and in a decentralized manner. Plants with a capacity to process between 2 and 10 tons of municipal solid waste per day have been established in cities in Cambodia, Sri Lanka and Viet Nam and, now in different areas of Pakistan particularly in Islamabad, Sakrand (Sindh), Mardan (Khyber Pakhtunkhwa) by Dr Akhtar Hameed Khan Memorial Trust.

Although AHKMT has worked with multiple stakeholders and has successfully sustained several IRRC in different parts of the country, the one meant to established in Union Council BharaKahu of Islamabad turned out to a tough nut to crack, thanks to lacunas in administrative measures that led to the stalled progress on the project. AHKMT and CDA/MCI, MOCC, EPA, local government, ICT Administration everybody was roped into making this project a success story, Alas! It didn't happen.

The non-implementation of the project proved that it's not the funds but a committed person who initiates a project. In most of the cities local bodies system do not exist and political people are not working and secretaries at UC levels do not take interest in such projects that are although quite needed by the societies, but the people at the helm of the

affairs in civic matter seldom make the move. The Rs69 million project funded by Engro Foundation could not see the light of the day lack of political presence in the higher echelons of powers of the civic body while the secretaries did not take interest in allocating the required piece of land for the IRRC.

The project could have been a physical facility of solid waste management and aimed at recovering valuable resources from waste. Three major activities could have been carried out by the IRRC: collection of segregated waste, processing of waste and sale of the resources generated.

The main focus of IRRCs would have been on organic waste, which typically comes from kitchens, restaurants, and wholesale vegetables or fruit markets. Inorganic waste – mainly paper, packaging materials made of plastic, glass, tin, aluminum, etc. –could have also collected and stored on in the IRRC, for subsequent sale, when market rates could have been at its most favorable.

AHKMT INTENDED TO INTRODUCE NEW INNOVATION FACET

A new innovation could have been executed at this IRRC that this IRRC could have been the first such set up which should have been built on government land, the IRRC could have segregated plastic collected from general waste. And it could have been sold as raw material to industry.

The pilot project in Bhara Kahu was designed for 4,000 households from where daily waste would have been collected and transported to the IRRC where it would have been reduced and converted into a resource. The kitchen waste would have been converted into compost while the recyclable plastic and other items could have gone to the industry. This facility would have sustained itself generating revenue from the sale of compost and getting the monthly fee from households against the waste from door step.

AHKMT like its past success stories intended to make this IRRC functional and self- sustained and then hand it over to relevant government department. The project was planned to engage all relevant stakeholders to understand the working of this model and replicate it into other parts of the country as well.

The project would not only have saved government resources (transportation, human resource, land) but would have a positive impact on the environment on a considerable ground which would have definitely affected the lives of thousands of dwellers in the area. The project would have helped stop thousands of tons of waste and plastic especially from reaching the Rawal Lake through its catchment areas that always results in environmental and health issues. This initiative would have saved acres of land from degradation annually as well where waste is dumped besides saving huge amount of government budget utilized for transportation of waste and purchase of landfill sites.

The AHKMT was to given task of construction of IRRC, collection of waste from 3000 HHs and processing, production of compost out of 60% wet waste, transfer recyclable items to industry. While Engro Foundation was assigned the role of financially support the model. The CDA was to allocate a 5 kanal piece of land for construction of IRRC, transport 15% rejected waste to landfill site, while EPA was to approve IEE report, align the project with environmental standards, while Ministry of Climate Change was to develop a networking and coordinate with stakeholders whereas local government was to facilitate in primary collection system. The local community and influential of the area were to mobilize the community for cooperation.

For this purpose, a stakeholders meeting was also conducted on December 14, 2022 at Islamabad Hotel Melody Market, Sector G-6 Islamabad in which an Advisory Committee was proposed. The Committee was aimed at establishing a forum for addressing the concerns and interests of area constituents to be included in the solid waste planning process and policies. CDA did not take interest in notifying the committee for proper activation.
Due to lacunas created by CDA, the project could not see light of the day as CDA did not sign a memorandum of understanding in this regard.

Dev Talk 6, Conversation with Sumaira Gul and Hamid Ullah on Solid Waste Management. "Trash is Cash"

An insight into our journey

Landfills are exploding and more waste is being burned than ever before: our reliance on single-use plastic products and packaging is causing irreversible damage. Is there a way to tackle our solid waste and plastic consumption, DEV 6 host Ms Mahnoor who was joined by Mr Fayyaz Baqir held a healthy conversation with Dr Akhtar Hameed Khan Memorial Trust CEO Sumaira Gul and e-Guard CEO Hamid Ullah on Solid Waste Management: "Trash is Cash" in June 2023.

They discussed in detail the journey initiated by Hamid Ullah and Sumaira Gul on Solid waste management, how it was initiated, what sort of hiccups they faced in this journey and what had been their achievements.

Hamid Ullah and Sumaira Gul gave an insight into their journey as how it began. the couple shared their life story which all began while they were living in a locality situated near a sump site of Municipal Committee in Raja Bazaar, Rawalpindi.

They discussed how Mr Fayyaz Baqir asked us to initiate a pilot project on solid waste in the area, and asked us to meet Dr Akhtar Hameed Khan in Karachi who became their inspiration and on returning from Karachi they introduced a pilot project on sanitation by laying down sewerage lines on self-help basis. they pointed out that this pilot became the baseline of their future course of life because it taught them lots of things which they practiced later in their lives.
they divulged details of how they initiated the project for 2000 households in Dhoke Syedan, a team from UNHABITAT visited the locality and they liked the work and offered AHKMT to replicate the model in six cities. But they were still finding problem in what should be done with the garbage. So in 2012 to 2013 a person from Bangkok visited AHKMT and introduced them to a model which could help reduce the waste and prepare compost from this waste. It was Integrated Resource Recovery Centre model and AHKMT initiated the first pilot in Jammu and Kashmir Housing Society in Sector G-15, Islamabad.

they also shared their success of this decade long journey of Dr. Akhtar Hameed Khan Memorial Trust (AHKMT) and e-guard which has been replicated in different cities like Islamabad, Mardan, Sakrand Sindh.

When Fayyaz Baqir asked as why the work is not spreading around the country and why municipal governments are not taking this model seriously and what is the impact of training provided to government institutions like Lala Musa Academy, to which Sumaira Gul replied as at some places like Islamabad the land is quite costly and we are not getting land in rural areas of Islamabad. We visit small towns where we get land but the municipalities in these towns don't have funds to initiate the project. This model can be replicated for 3500 households in a union council which can be sustainable which internationally costs around US$20,000 per ton but we have reduced the cost and built a 5 tons capacity IRRC in Sakrand Sindh at cost of around Rs3.5 million to Rs4.5 million. It is only a committed person who initiates the project. In most of the cities local bodies system do not exist and political people are not working and secretaries at UC levels do not take interest in it. Even we initiated a study for establishing an IRRC in BharaKahu UC in Islamabad which was funded by Engro Foundation. It was Rs69 million project and due to lack of political presence and the secretaries did not take interest. CDA did not take interest in it. We did not get land so this project could not be initiated. At some places we faced political issues and at some administrative issues.

However, Hamidullah and Sumaira Gul said that despite all odds, they were being happy that their our model has achieved recognition at national level through Ministry of Climate Change and it introduced and recommended the model in 12 cities across Punjab where clean green projects were initiated and they had their solid waste management companies as well as different cities in Khyber Pakhtunkhwa and Islamabad. As you spoke about Lala Musa Academy which is the sole academy in Punjab which is teaching our model to government officials for the past three years. We visit the institutions for the four trainings in the academy every year in which our model is taught.

Hamid Ullah pointed out that a team from GGGI Laos visited Islamabad for getting training for running an IRRC in their country. He pointed out that GGGI had already established an IRRC but they were finding it hard to run it so they came to Islamabad for a training and learnt a lot through our successful model.

In Pakistan when a government institution or NGO or a university takes up a project of solid waste management they contact AHKMT. Even AHKMT has been running these IRRCs without any donor money sustainably. They are providing land, providing money for technical assistance to AHKMT. Even now AHKMT has initiated a zero charge MoU with Margallah Housing Society in D-17 Islamabad.
When the interviewer, Mahnoor asked whether AHKMT team had any regret in not using any tool that could have helped achieve more success, Sumaira said that there are many people who have degrees in specified fields, I remember when we met DC Muzaffarabad, he asked us in which subject we did our masters. He asked whether we studied environmental sciences. Although we both have master degrees in political science but we don't have any degree in the field we have been working in. when we see people like environmental scientists and MBBS or B.COM degree holders working in the field we realize that had we acquired the degree in environmental science we could have been doing a job in some institution. But now with our practical experience we have found our livelihood in solid waste and despite not having the relevant degree we have done many innovations in the field and Mr Hamid Ullah will tell you how much interest a gardener is taking in worm compost like Black Soldier Fly instead of PhD doctors from NUST. I believe it will turn out to be major business in Pakistan in coming years.

Hamid Ullah said he also regrets not having a degree and lack of funding but was thankful that now they have achieved recognition everywhere in Pakistan.

Sumaira Gul added that they learned from their mentors like Mr. Fayyaz Baqir andMr. Arif Hassan that no work can be done with money, the resources can be generated from government, NGOs, housing societies and community.

Organic Farming

Wheat production through organic compost

E-guard established model farms in district Chakwal using the compost which is produced in Islamabad. To check the results of the compost e-guard provided Haryali compost to three different farmers namely Nasim Abbas, Ammar-ul Hassan and Abdul Aziz in village Pindi Gujran during 2022 for wheat crop. All three farmers were given 1.2-ton compost to use for one-acre land. All three farmers used the compost in different types of land (Local names of the land) Maira zameen (sandy) and Kali zameen (less sandy).

The crop was good where two farmers Nasim Abbas and Ammar did not use any other artificial nutrients or chemical fertilizers in the fields of wheat. Third farmer Abdul Aziz used DAP chemical fertilizer in addition to Haryali compost. The wheat of Nasim Abbas was 1480 Kgs per acre, the production of Ammar was 1560 Kgs per acre while the production of Abdul Aziz was 1640 Kgs per acre.

A special benefit of the compost was to these three farmers in the area that when they sew the wheat in month of November, there was a hailstorm in the area and the soil get hard due to hail storm but the soil of these three farmers was soft and growth of seed was good.

Rice grown through organic compost

A representative from Mardan Solid Waste Management Company Khaleel Akbar said that he used the compost in his field of rice and yielded 46 mound of rice per acre whereas in comparison his nearby farmer only yielded 40 mounds of rice from per care using normal fertilizers. He said we yielded six mounds of rice more by using organic compost and another encouraging aspect of using this compost was that the crop was ready six weeks earlier than the normal time.

Sugarcane

It has been three years since the IRRC was established in Mardan, Khyber Pakhtunkhwa and Mardan Solid Waste Management Company has been successfully running this

facility since then. The compost produced by the IRRC is quite popular in the region and locals purchase it from IRRC Mardan for using it in their farms and fields. The Mardan Waste Management Company auctions the compost by its IRRC every year which enables the waste management company to generate a handsome amount of money.

It has been years that Dr Akhtar Hameed Khan Memorial trust has been getting jiggery (Gur) prepared from Mardan and present it to friends and family as a gift in winters. This year AHKMT used organic compost produced by IRRC Mardan and cultivated sugarcane in the area for production of organic jaggery (gur). For this purpose, we used 1500 kilograms' organic compost in 12 kanal of land and the result was outstanding.

In an interview with AHKMT team the cultivator Qadeem Khan said that he was 70 years old and during his entire age, he had never seen such a result of sugarcane cultivation and its size which was quite encouraging and enormous. He said usually the size of sugarcane remained around 8 meters but after using organic compost he found 15 meters long sugarcane which was quite astonishing for him, his family and nearby farmers. He also said that the thickness of the sugarcane is also impressive and its taste is quite impressive and the jaggery prepared from this sugarcane is also great. He also hoped next time the size of the sugarcane will also be better and its production quantity is double as compared to past. After using the compost provided by AHKMT then the initial result was not encouraging as weeds started growing after first water given to the field. Later when we watered the field for the second time the crop started growing encouragingly and its final result is great.

A representative from Mardan Solid Waste Management Company Akhtar Khaleel that he used the compost in his field of rice and yielded 46 mound of rice per acre whereas in comparison his nearby farmed only yielded 40 mounds of rice from per care using normal fertilizers. He said we yielded six mounds of rice more by using organic compost and another encouraging aspect of using this compost was that the crop was ready six weeks earlier than the normal time.

Jaggery (Gur)

Switching to a healthy lifestyle does not mean bidding farewell to desserts. There are a lot of options available to replace refined sugar. But in most cases, they end up causing more harm than good.

Artificial sweeteners are more dangerous than white sugar in the long run. But do not worry, there is a much healthier and equally sweet alternative available.

Organic Jaggery is the healthiest, naturally obtained, and closest substitute of sugar. And Mardan, the second largest city of Khyber Pakhtunkhwa is famous for its jaggery. There are thousands of Jaggery production areas in Mardan district where thousands of tons of molasses are produced annually, which is not only sold locally but also sent to Punjab.

Every year we prepare jaggery in our locality and gift it to friends. For making it a delicacy for winters, we include, peanuts, fennel seeds, black pepper and some other ingredients to make it a delicacy worth tasting.

This year we cultivated sugar cane in around 2 acres of land in Mardan using organic compost as nutrient and as a result the product of jaggery this year could be easily called organic jaggery.

Free from harmful chemicals:
Our organic jaggery that is obtained from the juice of sugarcane is boiled until it thickens and hardens. The pure goodness from nature itself is then packaged in small cubes. Switching to organic jaggery limits your exposure to harmful chemicals and pesticides. With less exposure to toxins, organic jaggery is found to be rich in vitamins and minerals. Jaggery is an excellent source of iron which is essential in the production of haemoglobin in the body. Eating a piece of jaggery daily can help women deal with PMS symptoms including cramps, mood swings, and abdominal pain. Eating a small piece of jaggery can fulfill your daily requirement of iron. This is highly recommended for Anaemia Patients.

Low in calories than sugar and rich in Vitamins:
Sweeter than table sugar, jaggery is much lower in calories comparatively. Sugar leads to weight gain, whereas jaggery helps with water retention in the body, hence promoting weight loss. Organic jaggery is rich in vitamins like iron, zinc, magnesium, and potassium. According to Ayurveda, jaggery that is free from chemicals is an exceptional remedy for breathing disorders. Jaggery helps to clear the respiratory passage and deals with chest congestion while sugar has no health benefits.

Acts as a Detox:
This is the sweetest way to detox your body. Jaggery cleanses the liver by flushing out toxins from the body. Eat a small piece of jaggery every day to remove harmful toxins

from your body and improve Liver health.

Increases immunity in a tasty way:

Our organic jaggery is power-packed with antioxidants and minerals like zinc and selenium that help prevent free radicals which make jaggery anti-aging as well. It boosts resistance against infections and strengthens your immunity.

Improves digestion:

Our jaggery activates the digestive enzymes in our body by helping bowel movements. Our ancestors were right when they advised us to eat something sweet after the meals. Eating a piece of jaggery after meals aids digestion and prevents constipation.

STEVIA

Stevia is an intensely sweet-tasting plant that has been used to sweeten beverages and make tea since the 16th century. The plant is originally native to Paraguay and Brazil but is now also grown in Japan and China and now even in Pakistan too. It is used as a non-nutritive sweetener and herbal supplement.

A non-nutritive sweetener is one that contains little to no calories. Stevia is used as a healthful alternative to added sugar in many meals and beverages. Stevia is 200 to 300 times sweeter than table sugar. It typically requires about 20 percent of the land and far less water to provide the same amount of sweetness as other mainstream sweeteners.
It can be grown at homes as well. Dr Akhtar Hameed Khan Memorial Trust and e-guard have started growing this plant in B-17's integrated Resource Recovery Centre. We are planning to commercialize this production in future
As an alternative to sucrose, or table sugar, using stevia as a sweetener carries the potential for considerable health benefits.

Stevia is considered "no-calorie" on the Food Data Central (FDC)Trusted Source. Stevia does not strictly contain zero calories, but it is significantly less calorific than sucrose and low enough to be classified as such.

The sweet-tasting components in stevia sweeteners occur naturally. This characteristic may benefit people who prefer naturally-sourced foods and beverages. The low calorie count qualifies Stevia to be a healthful alternative for diabetes control or weight loss.

Here are some of the possible health benefits of stevia.
Diabetes: Stevia sweeteners do not contribute calories or carbohydrates to the diet. They have also demonstrated no effect on blood glucose or insulin response. This allows people with diabetes to eat a wider variety of foods and comply with a healthful meal plan.

Weight control

Stevia can replace sugar in a diet to manage weight. There are many causes of overweight and obesity, such as physical inactivity and increased intake of energy-dense foods that are high in fat and added sugars.

Stevia contains no sugar and very few, if any, calories. It can be part of a well-balanced diet to help reduce energy intake without sacrificing taste.

Blood pressure

Certain glycosides in stevia extract have been found to dilate blood vessels. They can also increase sodium excretion and urine output.

Children's diets

Foods and beverages containing stevia can play an important role in decreasing calories from unwanted sweeteners in the diets of children.

MINT

Although Pakistani mint is quite good but the flavour of European mint is absolutely great. It can be used in form of mint tea of beverages. Mint tea has been celebrated for centuries in European and North African countries. As a herbal tea, mint tea has gained popularity for offering a powerful yet relaxing taste. The most well-known type of mint tea is peppermint tea, which contains menthol — the reason why you sometimes feel that cooling sensation in your throat when you eat a peppermint.
Dr Akhtar Hameed Khan Memorial Trust and e-guard have started growing this plant in B-17's integrated Resource Recovery Centre. We are confident a beverage made up of mint and stevia will be very good in taste which will be a local produce.

Zero Invesment Zero Waste Society D-17: Another feather in the hat

Margallah View Housing Society D-17 is situated along GT Road in Islamabad. It is a private housing society near Sangjani Toll Plaza which is housing around 2000 households.

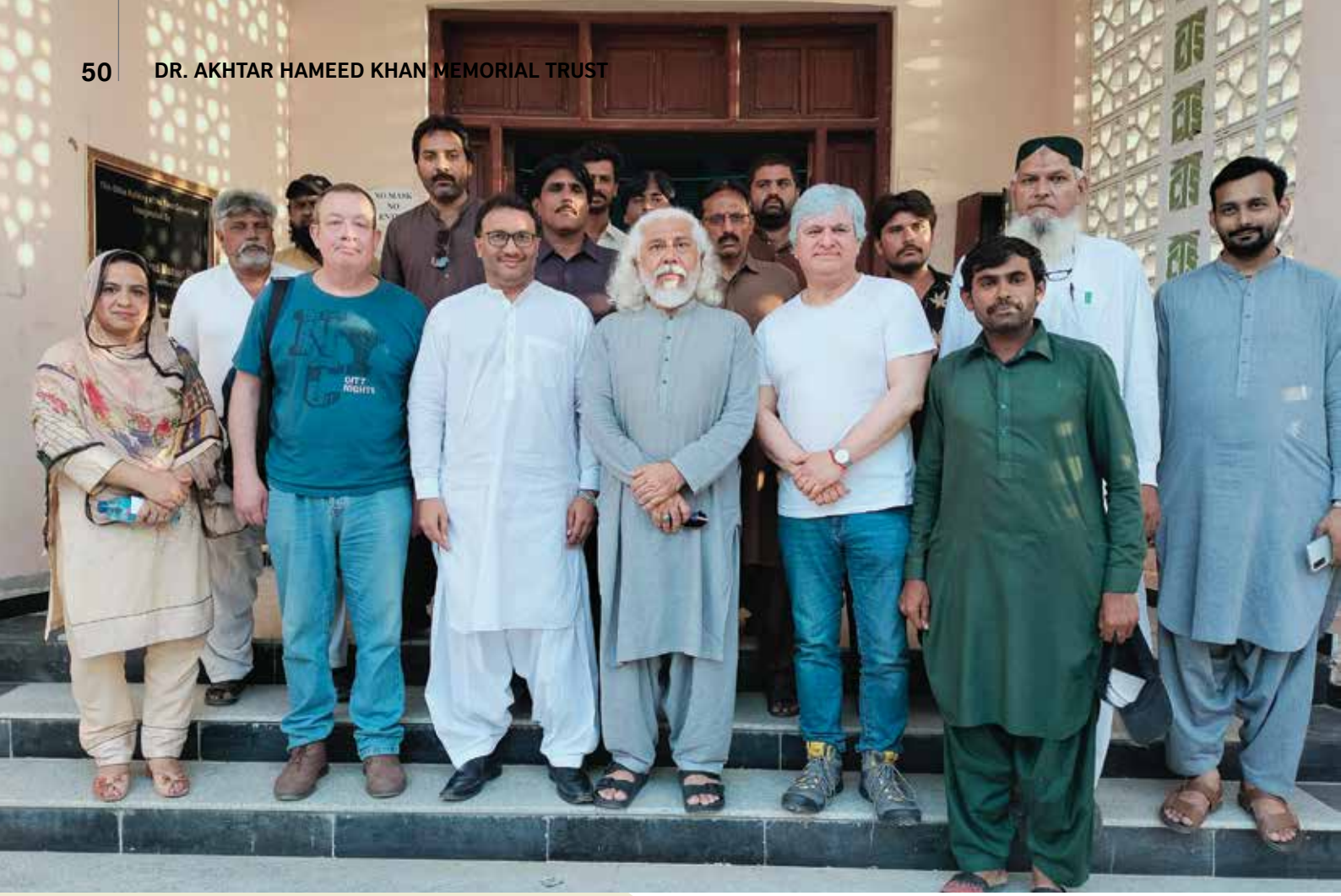
Since July 01, 2023 e-guard Islamabad has signed a memorandum of understanding with the housing society for collection of solid waste for seven years' term on zero charges basis. Dr Akhter Hameed Khan Memorial Trust has been playing a role of a mobilising the society. The basic aim behind this initiative is to establish this housing society as a role model and its model could be easily replicated in other parts of the country.

IRRC Development

Margallah View Housing Society D-17 provided a 2 kanal land plot attached with STP in the housing society to e-guard and e-guard has started collection and processing the solid waste at the IRRC established on this land. The society built the boundary wall and provided a room for office. E-guard prepared a shed for segregation and covered it with its own expenses.

Dr Akhter Hameed Khan Memorial Trust conducted a cleanliness week in the society from August 7-14, 2023. Apart from school students, youth from the housing society and students of Riphah International University organised the week.

Dr Akhtar Hameed Khan Memorial Trust also started growing stevia, mint, Aloe Vera, Moringa with the help of horticulture department of the housing society.
AHKMT team as part of its plastic reduction and kitchen gardening has started training of children and women of the area. Although the activity is in its initial stage but AHKMT is hopeful it will yield good results.



Sindh Sakrand Shelter

Dr Akhtar Hameed Khan Memorial Trust initiated the work on building a shelter in Sakrand, a town in remote part of Sindh, with the help of Sayyed Munir Shah, chairman Town Committee Sakrand. The shelter was built for the workers who have attached with integrated resource recovery centre in the town established by the Trust quite a while ago.

AHKMT also bought a 4 kanal piece of land on which we plan to build homes. AHKMT also planned to provide assistance to the families affected by recent floods in the area.

This project helped provide shelter to the families working field of solid waste management.

During the interaction with these workers AHKMT learned that many workers either don't own a house or those who already have a house need to get their repaired but don't have enough resource to finish the task. Therefore, we collaborated with Sayyed Munir Shah and provided funds to them.

Visitors Comments

Integrated Resource Recovery Center

07-12-22

Sher Jahan
CEO WSSC Dera Ismail Khan

"It is a very impressive initiative and I wish to replicate it in DI Khan."

10-12-22

Mufti Qazi Hassan Raza
Member SMT

"Today I visited IRRC in B-17 and it is an impressive project which isuseful for the society."

14-12-22

Fawad Soomro
Engro Foundation

"What a great place, absolutely thrilled to see amazing work of AHKMT."

02-01-23

Amna Saeed,
Environmental Engineer

"Really impressive initiative, we should appreciate such efforts."

02-01-23

Javeria Iqbal,
Environmental Engineer

"It is a very positive initiative that should be replicated i rest of the country."

16-01-23

Ali Awan Qamar
MD LWMC

"A very useful project that is effectively coming up with ways to consume and reduce garbage."

16-01-23

Dr Iftikhar Ahmed PSO NARC
Dr Tariq Sultan Director/ NARC

"A viable project for cleaner environment providing compost for farming community."

03-02-23

Mr Shams
Sr Program Manager Hashoo Foundation

"We have had an amazing experience visiting IRRC "

03-02-23

Ali Bakhsh,
program Officer

"There was a learning experience in utilization of waste to environment friendly approach."

07-02-23

Ms Sajeela,
Climate Action Program Hashoo Foundation

"A sustainable project for the environment and should be redlicated in other regions."

8-02-23

Dr Ejaz Ahmed,
Senior Program Fellow, Institute of Urbanization Islamabad

"It was pleasure to visit the centre and understand the entire process of solid waste management making it a business. wonderful work. Keep it up."

20-03-23

Kamran Naeem

"Excellent initiative thank you! It is great to see the dedication and professionalism of IRRC staff. Well done! Keep it up."

23-03-23

Dr Kamran LWMC

"Great initiative by AHKMT team. their service to society is remarkable."

30-03-23

Brig M Aslam Khan
(retd), President Rural Development Foundation of Pakistan

"Pleasure to visit the site of solid waste being managed by AHKMT. It is being managed very professionally by the team led by Sumaira Gul."

27-04-23

Engineer Muzamil

"It is a great initiative and really appreciative. More power to your team."

31-05-23

Ch Osama

"Impressed by the project. such initiatives can help make Pakistan and healthy country."

15-08-23

Babar Hussain,
Assistant Director MSDP

"Visited the plant and learn new techniques of recycling of solid waste and will try my level best to implement in our cities as well. Thank you to Ms Sumaira and her for giving is a comprehensive briefing."

15-08-23

Altaf Veesar, Santosh Shab Lal, Abdul Manan and Pandhi Khan

"Today we visited the IRRC in B-17 where Ms Sumaira briefed us about the vermicompost and MFS plant. It was great experience for us to see the working and arrangement of IRCC."

15-08-23

COP USAID WAS

"Ms Sumaira and her team gave a very comprehensive and interesting insight on solid waste management. this is indeed replicable and hope that it is done by the Municipal Committee Jacobabad . I would like to thank you for the great hospitality."

14-10-23

Jai Prakash,

"Amazing Solution to Pakistan's waste problem. Much needed facility. this model should be replicated in rest of Pakistan."

29-08-23

Program Coordinator IOU

"It is inspiring how you are using waste as wealth. you are doing this great service to the society."

7-12-22

Engr. Imran Hameed

"A well trained team and Ms Sumaira Gul is very good in conceptualization and operations of the unit. She has a satisfied us with required information and is cooperative."

12-10-23

Engr Atiq ur Rahman

"Excellent work done by IRRC team. Good job"

7 12-22

Hamid Latif Rana
MD Wasa

"We saw an impressive effort."

12-10-23

Llaqat Ali Chattha,
Commissioner Rawalpindi

"It is very good project. I feel that this a very successful solid waste treatment plant. It should be replicated in all union councils across the country."

Media Coverage

Pindi Edition — Pages — Magazines — THE NEWS INTERNATIONAL — 23 October, 2023 — Downloadable Version — Archive

14 CITY NEWS

'Solid waste should be deemed as opportunity instead of crisis'

Commissioner Rawalpindi vows to replicate IRRC model in the district

Pindi Edition — Pages — THE NEWS INTERNATIONAL — 29 March, 2023 — Downloadable Version — Archive

THE NEWS Wednesday — CITY NEWS

'Lesser amount of waste to be dumped at landfill sites'

BUSINESS RECORDER

Lahore, Wednesday 29 March 2023, 7 Ramazan 1444

LWMC, AKHMT ink MoU to improve waste management process

RECORDER REPORT

LAHORE: Lahore Waste Management Company (LWMC) and Akhtar Hameed Memorial Trust (AKHMT) on Tuesday inked a memorandum of understanding (MoU) to improve the waste management process by adopting scientific procedures.

As per the MoU, for the first time in Lahore, the model project for waste segregation and better utilisation at the level of waste enclosures has been formally launched. In this connection, a signing ceremony was held which was attended by AKHMT CEO Sumaira Gul, AKHMT Director Hameedullah, LWMC Deputy CEO Fahad Mehmood and Muhammad Aurangzaib along with General Manager Planning and Projects Dr Kamran and other officials.

While addressing media after the conclusion of signing ceremony, LWMC CEO Babar Sahib Din said the Trust would provide support to the LWMC for a better model of waste segregation and management.

"Waste segregation would be started in UC 81, 83, 198, and 218 as a pilot project, and workers would be trained to separate useful items from garbage," he added.

According to him, this project would prove to be a landmark and this would be the first step towards waste management through innovative methods. The success of waste segregation project was not possible without the cooperation of citizens. They were also running a public awareness campaign for proper waste disposal and better waste management. After the success of the model project, waste segregation would be formally started across the city.

On this occasion, AKHMT CEO Sumaira Gul said in the first phase, revenue would be collected for the Company by separating useful items at the level of waste enclosures.

"The green waste obtained from the enclosures would be used at the compost plant. In the new model of waste management, a lesser amount of waste would be dumped at the landfill site. Reducing dumping of waste at landfill sites would significantly reduce environmental pollution and public health problems," he added.

MEMORIAL TRUST RAWALPINDI
DR. AKHTAR HAMEED KHAN
AHKMT

Integrated Resource Recovery Center-IRRC

DR. AKHTAR HAMEED KHAN MEMORIAL TRUST

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Organic Farming