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Accidental Entrepreneurs: Recycling, Upcycling and Downcycling by Ecopreneurs at Bottom of Pyramid in Upper Swat

Dr. Muhammad Tariq[1], Dr. Gul Ghutai[2], Muhammad Arif[3]

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[1]Dr. Muhammad Tariq
Assistant Professor,
Center for Management and Commerce,
University of Swat
Muhammadtariq@uswat.edu.pk
[2]Dr. Gul Ghutai
Assistant Professor,
Sardar Bahadur Women University, Quetta
Gulghutai@sbkwu.edu.pk
[3]Muhammad Arif (Corresponding Author)
Ph.D. Scholar,
Center for Management and Commerce,
University of Swat & Assistant Controller of Examination, Iqra National University, Odigram
marif@inu.edu.pk

ABSTRACT

The study aims to examine contributions of accidental entrepreneurs working below the bottom of pyramid using an inductive qualitative research design in upper Swat. With a social constructivist paradigm, we strive to adhere the standards for reporting of qualitative research SRQR while using grounded theory as inquiry strategy. Overall, 14 interviews were done from reclamation workers, who are referred as accidental entrepreneurs for purpose of this study. The study findings denote that significant level of valorization is achieved by reclaimers, waste pickers and stockpile consolidators in categories of recycling related to Institutional waste, Construction and demolition (C&D) recycling, Festive Sacred Consumption recycling and Vehicular Waste. The precycling activities are done manually, albeit, not without significant occupational health risks and disease threats due to ignoring of safety standards. The study concludes that more efficient measures are employed by informal sector although their output contributes more to downcycling than upcycling type of recycling. The study recommends extension of municipality services to include recycling of waste through some form of job enlargements mechanism and contributes by showing how self-organized autonomous informal ecopreneurs working below the base can significantly enhance valorization to accidentally help combat against effects of anthropogenic global warming.

1. Introduction

The worldwide volume of global waste per day is estimated around 6 million tons by 2025 (Gutberlet, 2023). In Pakistan, the self-organized people who delve into pro-environmental recycling work are called accidental ecopreneurs as their businesses are pro-environmental (Nawaz, Yousafzai, Khan, et al., 2021). The prevalent recycling rate in Pakistan is approximately 14.5 % which is mainly contributed by the informal stakeholders (Domenech & Borrion, 2022). Limited information is available regarding earning sources of informal reclaimers

(Godfrey, 2021). The informal recycling has the potential to contribute about 5.5 % of the annual budget of Pakistan, if brought into the tax net through a formalization process (Iqbal et al., 2023). In the absence of formal recycling facilities, coupled with weak waste governance, Pakistan almost spend almost 20-40 of municipality budgets on waste collections (Othman, Noor, Abba, Yusuf, & Hassan, 2013).

Many countries in the Global South have less rigorously enforced standards for recycling when compared to the safety standards of occidental cultures (Mohamad, Husin, & William, 2007). However, due to the transboundary movements of leftover materials, such materials do not require a passport to reach world oceans, endangering marine life and biosecurity. Hence, calls for interventions from policymakers are germane for the formalization of such waste management and recycling businesses (Domenech & Borrion, 2022). More than 2 billion people across the world lack access to planned waste collection; let alone these, there are around 3 billion more people who lack access to controlled waste collection (Wilson & Velis, 2015).

Limited information is available on the earning models of reclaimers as their businesses evade public attention due to their informal, untidy and stigmatized business nature (Godfrey, 2021). Most of the time their businesses are functioning in the backdrop of unemployment, trauma or some tragedy and they become accidental entrepreneurs by scavenging. Since their work exhibit characteristic of ecopreneurship hence they are sometimes termed as ecopreneurs or sustainopreneurs. In this connection, prior researchers have studied and predicted the volumes of recyclables in adjoining district Swat terming such recycling actors as sustainopreneurs (Nawaz, Yousafzai, Khan, et al., 2021). This study adopts a new perspective of accidental ecopreneurs, due to the fact that their businesses are purely for economic gains, yet, their work is beneficial for environment as it creates frugal driven recycling practices. The concept of planned recycling is conspicuous by its absence in both rural and urban areas of Pakistan (Batool, Chaudhry, & Majeed, 2008). Most of the recyclers in Pakistan are located in urban areas such as Lahore and Karachi (Shaikh, Thomas, Zuhair, & Magalini, 2020) although both these cities in terms of air quality are ranked amongst top most polluted cities in the world. In Pakistan, more than 40% of Pakistan population is living at the bottom of pyramid (BOP) i.e., below the poverty line, which has compelled many people to indulge in informal scavenging to recycle in order to make ends meet in final weeks of a month (Khalid, Ghutai, & Tariq, 2025).

This inductive qualitative study strives to fill the lacunae by exploring upstream accidental ecopreneurs in rural areas working below the bottom of pyramid by way of acknowledging their work to lay foundation for further quantitative studies. The below the base of pyramid is a major concern for researchers (Prahalad & Ramaswamy, 2004) as it is responsibility of intelligentsia to lift them out of poverty as they are already working hard as they could.

A closer examination reveals that entire recycling value chain operates through cash-based transactions, especially in upstream intermediaries, which is a serious blow to development of formal economy aspirations. This is one of the reasons for dismal performance of waste management sector which continue to garner attention due to its poor performance in terms of widening circularity gaps.

Recycling activities generally encompass upcycling and downcycling. The pre-cycling activities refers to sifting and sorting of materials before formal processing. One the one hand, upcycling refers to conversion of waste material into upgraded value-added items. On the other hand, downcycling is the conversion of waste material into products which have less value or quality of products. Likewise, recycling refers to conversion of waste roughly of same parity value and quality products (Wang, Krzywda, Kondrashev, & Vorona-Slivinskaya, 2021). The rest of the paper strives to document the recycling practices used in upper Swat by reclamation workers such as stockpilers, consolidators and and wastepickers as purpose of the study.

2. Methodology

In this section the scholars explicitly argue why an emergent inductive grounded theory-based methodology is appropriate in the local context in reference to topic of study. The Grounded theory method of inquiry is chosen is there is lack of holistic and all-embracing apriori theory related to area of interest (J. W. Creswell & Poth, 2016; Yousafzai, Nawaz, & Khan, 2022). The substantive or raw theory evolves from data in Grounded Theory based studies through process of simultaneous data collection and analysis. It differs from scientifically tested theory as it only generates a set of categories, which explain a phenomenon of interest in form of propositions, findings or diagrams (Charmaz & Belgrave, 2019). Moving ahead, some discussion on development of interview protocol and attainment of point of theoretical saturation is followed by a point wise three-pronged analysis i.e., open, axial and selective coding analysis as per principles of grounded theory methodology (Creswell, 2021).

Figure 1: Map of the study area in district Swat showing upper Swat with modifications

2.1 *Data Collection*

In regards to data collection, the participants were initially very reluctant partly as they ostensibly wish to maintain face saving but inwardly strived to avoid government attention. The data was collected in tehsil Charbagh and Khwazakhela in district Swat. In Pakistan there is no scrap registration system as well as their possible involvement in procurement of stolen paraphernalia from drug addicts are reported by various studies. Multiple times assurance was given that their privacy be maintained with alias names (Rashid et al., 2023; Ullah, Ghutai, & Tariq, 2025)

2.2 *Sampling procedure*

The estimation of sample adequacy is rather inconclusive issue in inductive-qualitative, grounded theory inspired methods, especially at the inception of a study it is practically not possible. Hence, there is consensus that sample size in grounded theory cannot be pre-determined. It all depends on upon quality of data, the resultant concepts and theory arising from data known through the process of theoretical sampling (Foley, Timonen, Conlon, & O'Dare, 2021). For this study the point of theoretical saturation arrived after 14 interviews.

2.3 *Interview Protocol*

Rapport building measures were used such as use of ice breakers, upon initial contact because there is no concept of relationship-free interviews in qualitative studies. The interviewer, began with information elicitation through use of grand tour questions, followed by terminology related to their recycling work through taxonomic questions and mini tour questions regarding specific issues confronted by them during working (Jiménez & Orozco, 2023). The recycling owners were reluctant and worried as they presumed us to be agents of tax authorities. Part of their unexplained worry was due to their possible refugee backgrounds. Effective use of probes, prompts and even non-verbal cues of participants paralanguage were noted. Finally, member debriefings and follow-ups were done to enhance trustworthiness to ensure ethical standards(Mateen & Ali, 2020).

3. Results

3.1 *Open Coding: Key themes or categories identification*

As per traditions of Grounded theory, in open coding researchers create categories of information regarding the phenomenon of interest by segmenting the collected information (J. W. Creswell & Poth, 2016). According to (C. Creswell et al., 2021) *"coding is the process of organizing the data by bracketing chunks and writing a word representing a category in the margins"*. The data analysis process in grounded theory revolves around various coding stages (Nawaz, Yousafzai, Shah, Xin, & Ahmad, 2021; Tariq, 2018; Yousafzai, Khan, & Shah, 2021). As a general rule, coding falls under the categories of expected codes, surprising codes and codes of unusual of conceptual interest (Rogers, 2023). The study found out that in addition to already available information such as Textile Waste, WEEEs, Agriculture Waste, some new categories of waste recycling is undertaken by reclamation workers such as construction and demolition waste, Sacred consumption waste, Vehicular and institutional waste recycling. Hence, during the open coding stage a code book was created drawing on Saldana manual and Creswell, (2018) recommendations containing codes for C&D waste recycling, Scared Festive Waste recycling, Vehicular and Institutional Waste recycling.

3.2 *Axial Coding: Assembling of Core Categories*

In the axial coding phase the researcher assembles the categories identified in open coding in new ways by ways to present a coding paradigm or logic diagram (J. W. Creswell & Poth, 2016) as shown in figure 1 below. This process is done to identify a core or central category and explore the causal conditions, strategies, context and intervening conditions leading to specific consequences. The various categories such as C&D, Sacred Festive Waste, Vehicular Waste Recycling, Institutional waste (Medical and Industry and offices), municipal solid waste and Waste electrical and electronic equipment's were coded to form the logic diagram. For the analysis of this study only first four codes were taken to consideration as the final two categories were already explored by other scholars in Swat (Khalid et al., 2025). The data suggested that almost 100 percent of transactions occur on the basis of cash which signals existence of informal and undocumented economy. This causal condition explains

that most of the recycling done is of down cycling nature. The volume of waste is highest during summers as construction industry workers find more work during summers due to prolonged day time. Likewise, nowadays Eid Al Azha is also falling during Month of June i.e., summers in the context of district Swat.

Figure 2: Logic diagram of Recycled material codes categories based on data collected.

3.3 *Selective Coding: Integrating the core Categories*

In the selective coding stages investigator writes a story line which connects the categories in a process similar to integration of categories i.e., attainment of unity out of diversity,(J. W. Creswell & Poth, 2016). The C&D waste accounts for 30-40 % of waste worldwide which comprises of 80 % concrete waste with an average recovery rate of 20-30 %. The highest recovery rate is in UK about 89.9 % and lowest in China, which is less than 5% (Ruiz, Ramón, & Domingo, 2020). The area of upper Swat is rich in marble processing units due to its vicinity to mountains. The marble residuals extracted are used in dish washing powder and Telcom power as well as lime. According to (Marras, Bortolussi, Peretti, & Careddu, 2017) marble stone extraction on average creates 73 % waste which a significant threat to environment if not taken care by way of reusing and recycling.

Pakistan is ranked 9th in terms of cattle (Livestock) and is the 4th largest producer of milk and also ranked 11th in poultry production(Shah, Hayat, Tariq, Khan, & Wang, 2021). In the feast of sacrifice three quarters of Eid-Al Azha meat is distributed among the poor and needy thus reducing malnutrition among public as well as improve money circulation due to the billions of worth economic activities. However, the recyclers have experienced a decline in past couple of years due to lumpy skin disease prevalence in animals. The preceding analysis goes in consonance with Yadav and Samadder (2018) who contend that post sacrifice waste is co-managed by government and recyclers in Muslim populations.

According to one of the participants of study,

> *"Putrescible recycling such as hide which rots is done by specialized aggregators as well as charitable organizations. Some innovative uses of such waste include Bed weaving from leather, Eid Al Azha Leather and refuse Bones Crockery manufacturing, Vaseline making as well as sticky glue manufacturing"*

The institutional waste is recycled mostly under the watchful eye of government officials. Photocopiers and

indigenous low-cost refilling of printers has spurred growth to the extent that there is more demand for photocopiers (business) than supply of such second-hand machines. One big source of paper usage is flyers and micro photocopiers. Another source is Panaflex printing banners, flexes for election, conventions, competitions, advertising. Other than this, medical waste is mostly treated but some parts are recycled especially their plastic components. In a paper-based system there is excessive usage of paper for the operations of systems. Ironically paper-based entry system is still maintained even when there is adequate provision for online data management. The universal recycling codes are disregarded for plastic, paper and other items. In absence of spectrometric detection systems, the universal recycling standards are not followed and recycling is mostly downcycling with a lower grade item, suitable for a price conscious market.

According to a participant,

> "*Most of the paper is recyclable but some types*
>
> *are hard to process such as plastic and aluminum coated, waxed, gummed*
>
> *and gift wrapper paper."*

Moreover, the upper Swat and entire Malakand division enjoys tax exemption due to a legal gambit which were signed with formerly princely state effective till 2067 although government is reconsidering this by limiting the tax holiday (Nawaz, Yousafzai, Shah, et al., 2021). Hence, the motorization index in the upper Swat area is highest in comparison to rest of the country.

According to one participant,

> *"The area has very low employment opportunities due to its limited land, vulnerability to man made and natural disasters. Most businesses such as tourism are seasonal. Hence, most of the people do car bargain businesses as custom duty is not imposed in this area as every home has at least one or two cars for business".*

4. Discussion

The study Accidental entrepreneurship undertaken by Recycling by Ecopreneurs at bottom of pyramid in Upper Swat unveils the pro-environmental contributions of people working in abject poverty yet their efforts help combat the anthropogenic global warming (AGW). Their practices are low tech but highly creative in a sense that discarded material is upcycled and downcycled using primitive yet effective mechanisms involving minimal energy usage. This study extends the findings of prior authors whose work was mostly confined to limited categories of recyclables and used sustainopreneurs label for (Marwat, Ahmad, & Yousafzai, 2022) for waste pickers, waste consolidators and reclamation workforce (Khalid et al., 2025; Nawaz, Yousafzai, Shah, et al., 2021).

The current level of recycling activities is more inclined to recovery and recycling of downcycled items as upcycling facilities are not present in rural areas of upper Swat. Although, recycling is much celebrated to extent that it has become a trite in theory but in practice it is yet to achieve perfect closed loop circular systems, wherein, materials can be recycled indefinitely to reduce circularity gaps across the globe (Worrell & Reuter, 2014). Targeting items which are potentially more dangerous to human lives should be a priority consideration for governments across the world such as plastics which rose from 1.5 million MT in 1950 to 460 million MT in

2019 (Gutberlet, 2023; Yousafzai, Shah, et al., 2022). This study goes in Agreement with leading scholars who contends that indigenous people living at bottom of pyramid act as climate defenders such First Nations of Canada, indigenous people of Bolivia and ab originals in Australia and Campesipnos in Columbia (Chomsky, 2017; Yousafzai, Ghutai, & Akbar, 2024).

As developed by Scodel (1961) the Value orientation matrix serves as a useful lens to study man-nature relationships. Pakistanis are mostly subordinate to nature as they believe in fatalism and passive reception of nature by way of harmonizing oneself to nature. Part of the popularity of such recycling or stockpiling businesses is due to the ease of setting up of such businesses as well as exit of such businesses on road side stray plots with shutters implanted. Part of the problem of low efficiency of government municipalities is the fact that most of the workers are paid USD 95 per month. The average household cost per month is USD 223 (Eco Survey of Pakistan 2024). Poor economy with steep rise in inflation have compelled their workers to scavenge on recyclables especially during last week of the month. The findings entail that fact that the entire waste value chain from wastepickers, stockpile or bulking agents to dealers and transporters operate on a cash basis in an undocumented manner. This further grows the unbanked sector which is a serious blow to economic formalization as the country is grappling with worst economic conditions. Finally, the informal recyclers serve as an avenue for selling of stolen items on a cash basis which is a serious issue for the security of residents living in the area.

5. Conclusion

The proletariat class of people associated with stockpile recycling have risen from rags to riches mainly because of undesirability of waste management and recycling work in Pakistan, although cleanliness is considered essential part in muslin faith. There exists a self-prescribed grandiosity in discourse of people who avoid the social stigma associated with waste management, sanitation and trade of consolidation and stockpiling recyclables from municipal solid waste (MSW). These accidental entrepreneurs exhibit pro environmental behaviour through a creative sifting, sorting and segregation processes employing low tech frugal type jugaad innovation.

Findings of study denote that significant level of valorization is achieved by reclaimers, waste pickers and stockpile consolidators in categories of recycling related to Institutional waste, Construction and demolition (C&D) recycling, Festive Sacred Consumption recycling and Vehicular Waste among other categories such as WEEEs, Textile, Post Harvest and Plastic recycling. The precycling activities are done manually, albeit, not without significant occupational health risks and disease threats due to ignoring of safety standards. The study concludes that more efficient measures are employed by informal sector although their output contributes more to downcycling than upcycling type of recycling. There exists a structural conflict as the recycler gain is another person's loss at times but most of the time all the stakeholders experience power of their powerlessness as no chain is stronger than its weakest link. Extended producer responsibility (EPR) is needed to accelerate the recycling rate in developing economies like Pakistan which along with recycling codes are absent. The study recommends extension of municipality services to include recycling of waste through some form of job enlargements mechanism to further increase the output.

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