

*Circular Business Model – An exploratory study
of the logistics processes and sustainable supply
chain management of SMEs and Micro-
enterprises in Norway*

Blue Circular Economy Project Seminar

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Background information

- Plastics (of which used/discarded fishing nets are part) are seen as an important material, but too often the way plastics are used and discarded fails to capture the economic benefits of a more 'circular' approach and harms the environment. Due to the immature value chains most of the discarded fishing nets end up in landfill or incineration plants. Most of the companies making use of waste fishing nets, ropes and components (FNRCs) to develop new resources (products, inputs, raw material) are small/micro SMEs operating within a regional or local market with limited demand, lack of regular supply of input, high production cost among other challenges. However, opportunities exist for these businesses within the business-to-consumer (B2C) or business-to-business (B2B) markets.

Purpose of the study

- This research is to map out the supply chain management, logistics process of SMEs and micro-enterprises in Møre og Ramsdal and their motivations, challenges and barriers towards circularity

Brief literature review

Topics	Definition	Definition source
Circular Economy	“A circular economy is a systematic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the ‘take-make-waste’ linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources.”	(Ellen-MacArthur-Foundation, 2020)
Circular Economy	“[...] an economic system wherein planning, resourcing, procurement, production and reprocessing are designed and managed, as both process and output to maximize ecosystem functioning and human well-being.”	(Murray et al., 2017)

Brief literature review

Sustainable Circular Business Model	“The idea of circular business model is that it does not need to close material loops by itself within its internal system boundaries but can also be part of a system of business models that together close a material loop in order to be regarded as circular.”	(Mentink, 2014)
Sustainable Circular Business Model	“Circular business models are by nature networked: they require collaboration, communication, and coordination within complex networks of interdependent, but all actors or stakeholders are independent and not influenced by one another.”	(Antikainen & Valkokari, 2016)

Brief literature review

Logistics Processes	“Logistics is that part of the supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services and related information from point of origin to point of consumption in order to meet customers’ requirement.”	(Council of Logistics Management, 2000)
Logistics Process	“Any company becomes efficient if, together with its partners, it is able to reduce the costs applicable to the logistics activities such as supplies, warehousing, production, transportation, delivery etc. and if it satisfies its customers.”	(Szegedi, 2008)

Brief literature review

Sustainable Supply Chain Management	<p>“The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with inter-organizational business systems designed to effectively and efficiently manage the material, information, and cash flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short-term and long-term.”</p>	<p>(Ahi & Searcy, 2013)</p>
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Brief literature review

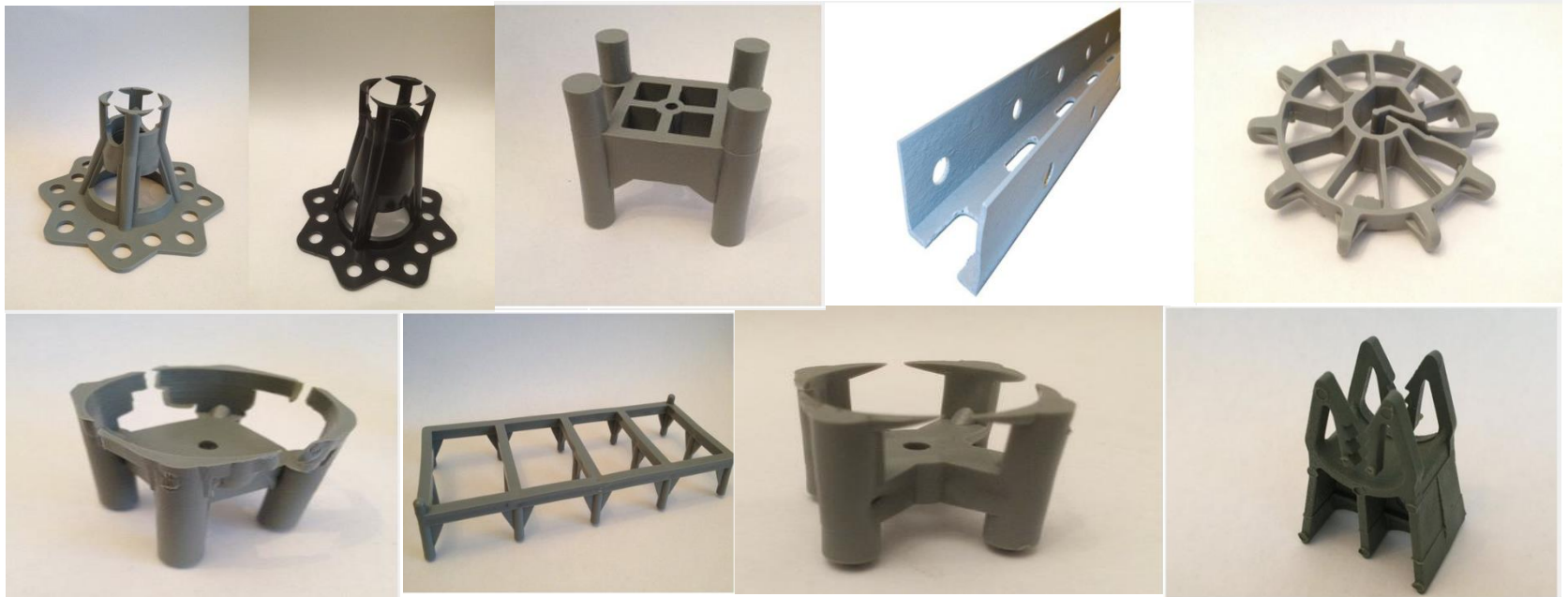
Reverse Logistics	“Reverse logistics is the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in process inventory, finished goods and related information from the point of consumption to the point of origin for the purpose of recapturing value or proper disposal.”	(Rogers & Tibben-Lembke, 2001)
Reverse Logistics	“[...] for retailers, reverse logistics is a way to get product that has been returned by a consumer back to the vendor. For manufacturers, reverse logistics is the process of receiving defective products or reusable containers back from the users.”	(Krumwiede & Sheu, 2002)

Methodology

- The **Case Study** method was applied. Data were collected through **semi-structured interviews** from the senior level managers from industry. For data validation, a **Delphi study** was performed on two levels.

Case companies

- ØRSKOG PLASTINDUSTRI AS
 - specializes in producing products (reinforcement chair, frame, top edge, U-list, distance wheel etc.) for the construction industry using recycled plastic material (defined by firm#1)



Case companies

- PLASTO AS
 - Creates a variety of plastic products, a majority of this for the aquaculture industry. It has the technology and know how to produce products of high performance from recycled materials, for certain products they have a complete circular material flow (defined by firm#2)



Case companies

- NOPREC AS
 - Recycles mostly FNRCs but also other plastics into granulate which can be used in production of new products (defined by firm#3)



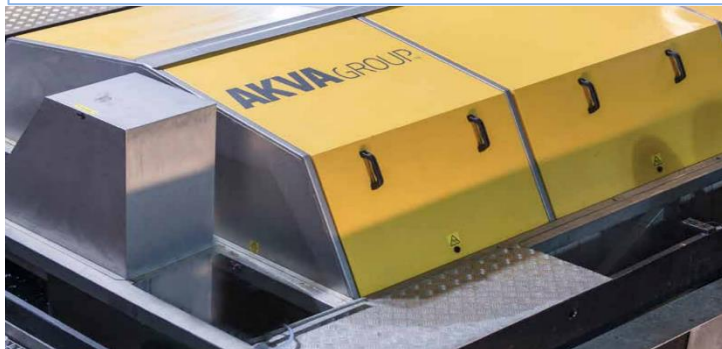
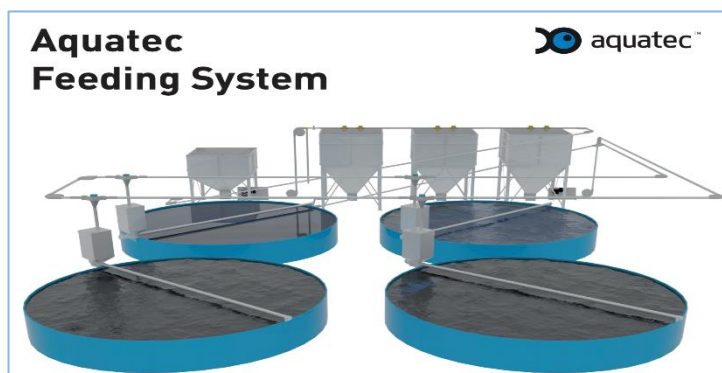
Case companies

- REPLAST AS
 - recycles plastic in various formats, work directly with manufacturers, collectors, municipalities and private actors (defined by firm#4)



Case companies

- AKVA GROUP
 - Supplies equipment to the aquaculture industry. Customer of firm #2 (PLASTO AS)



Findings

Findings (Model 1)

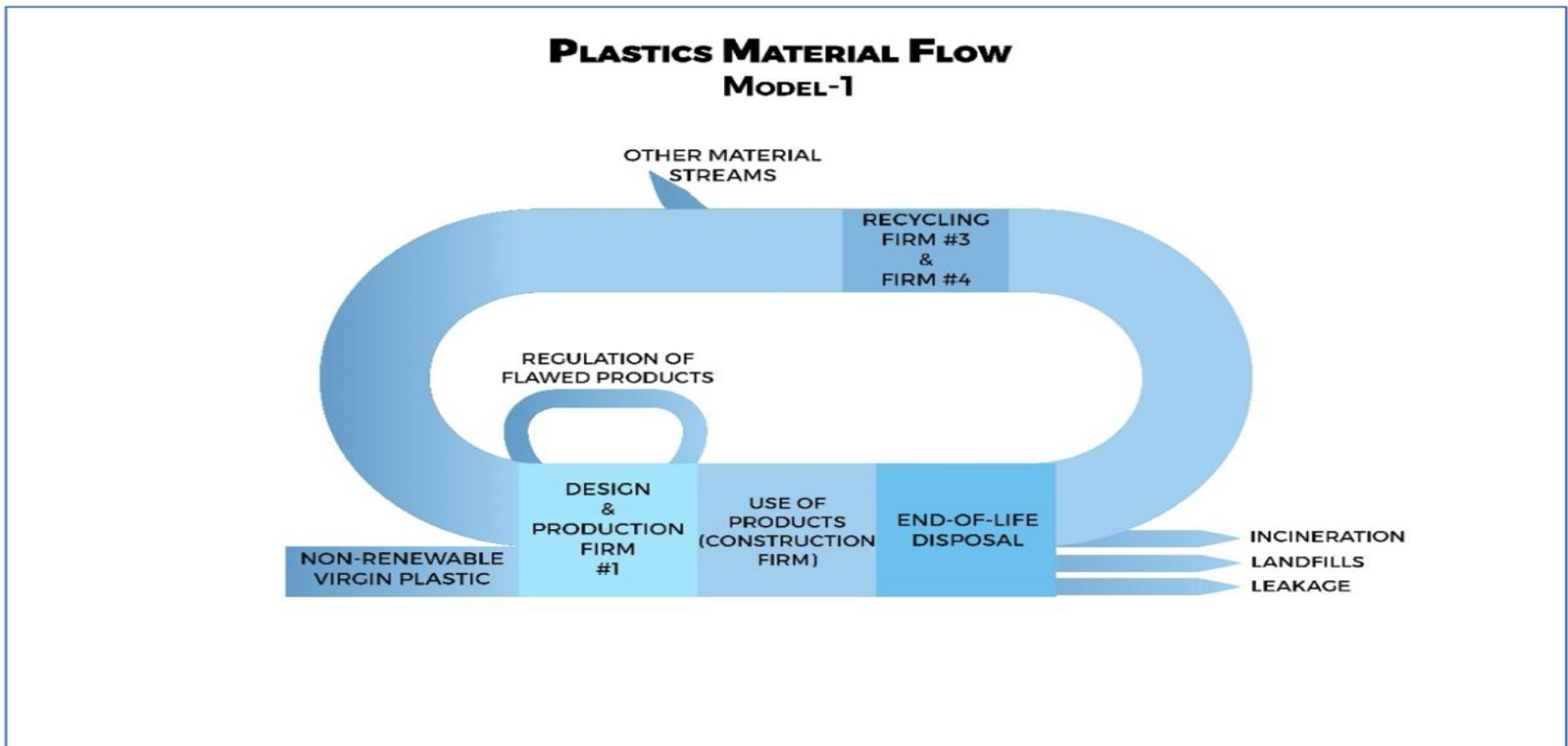


Figure 5. 1: Plastics Material Flow Model 1 (Researchers' own model)

Findings (Model 2)

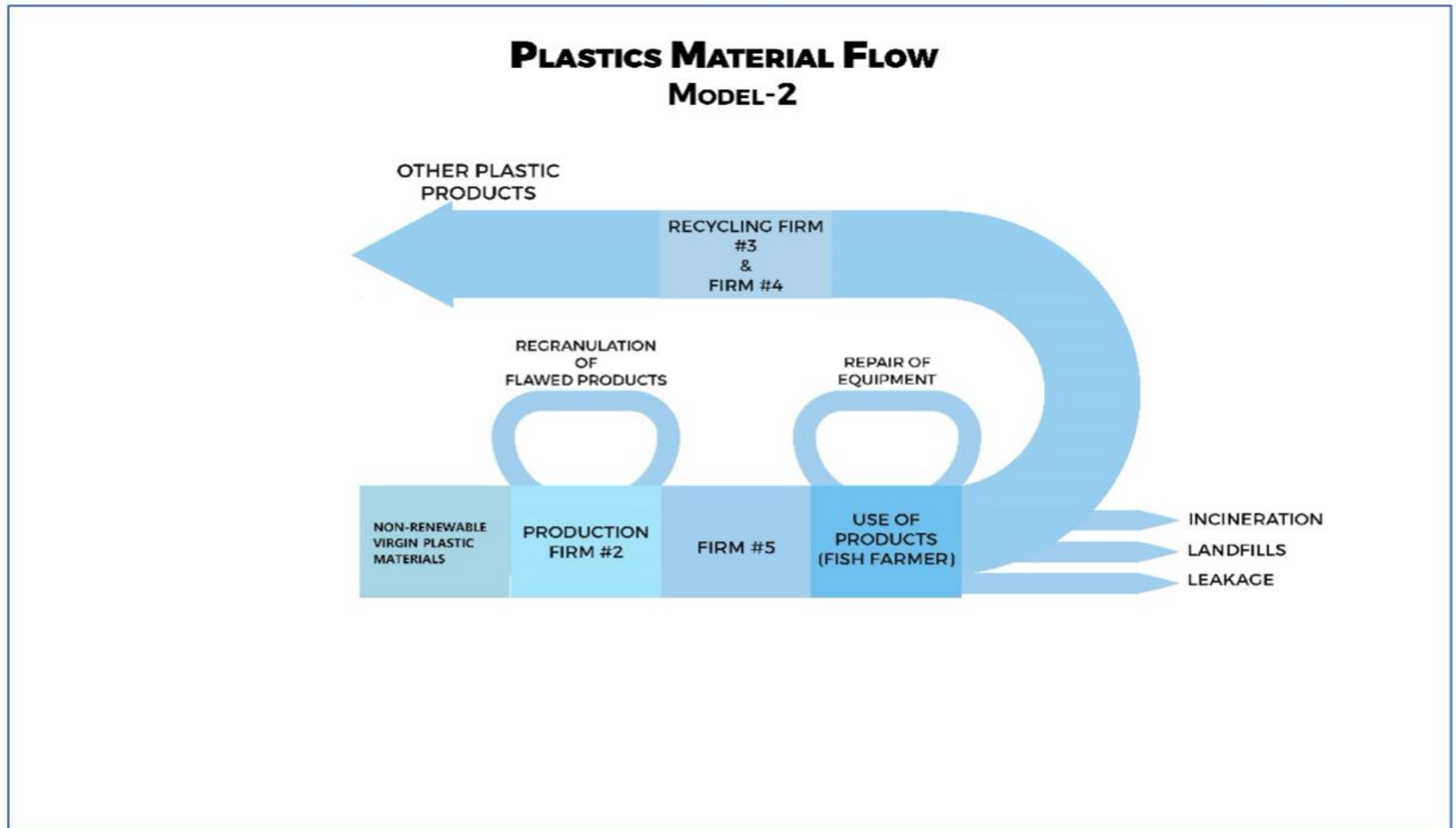


Figure 5. 2: Plastics Material Flow Model 2 (Researchers' own model)

Findings (cont...)

- Motivational factors towards Sustainability
 - Move to right direction and ahead of others
 - Cost saving
 - Opportunity for development, growth and expansion
 - Customers' positive feedback
 - ISO 14001 Certification

Findings (cont...)

- Challenges and barriers in the way of sustainability
 - Volatility
 - Uncertain product quality
 - Lack of proper documentation
 - Low landfill fee
 - Complexity and bureaucracy
 - Customer disclination
 - Unrecognized problem

Findings

- Present supply chain management of SMEs and micro-enterprises
 - Local suppliers
 - International suppliers
 - B2B model
 - Strategic partnership
 - Mixed strategy

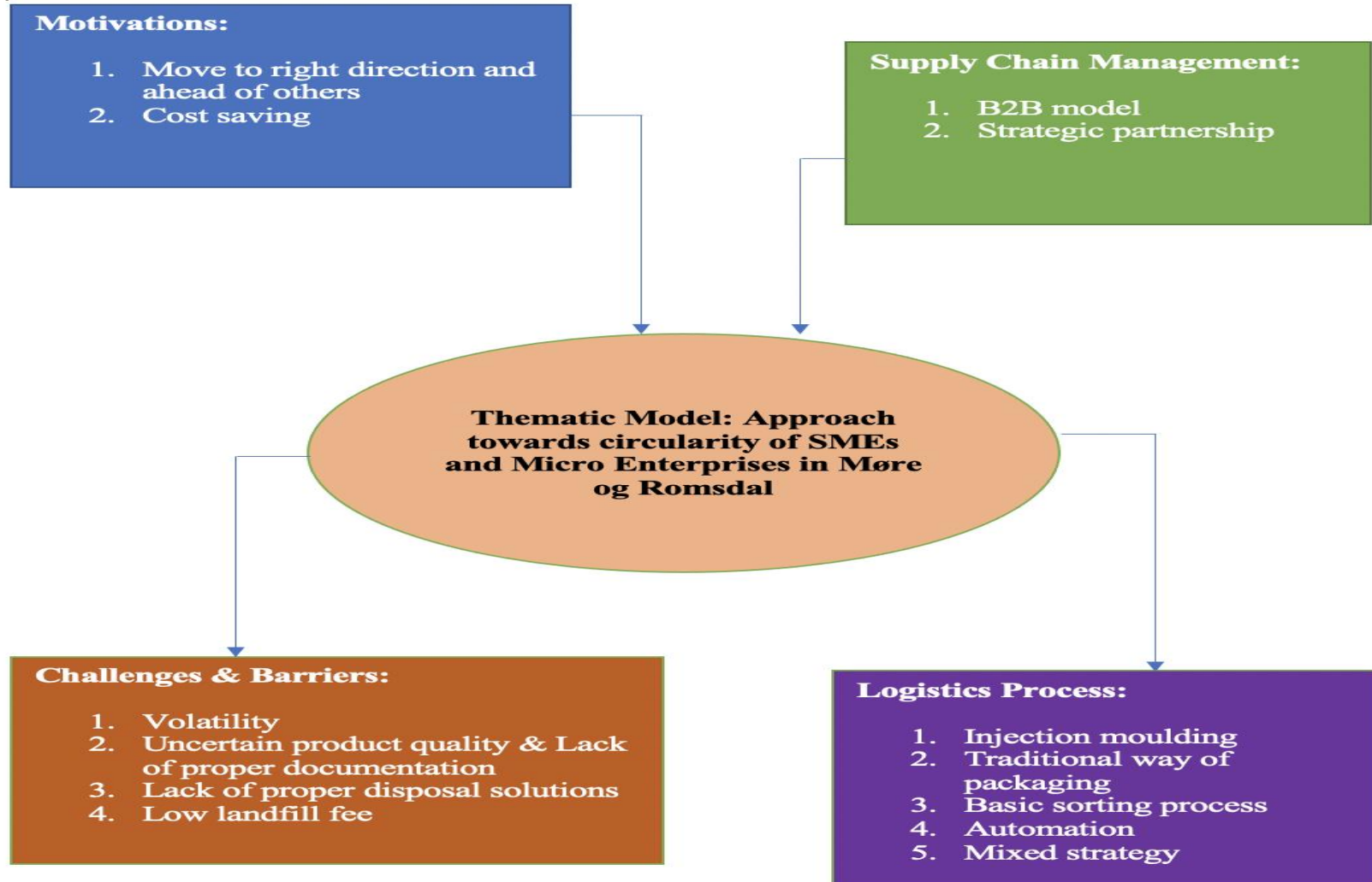
Findings

- Present logistics processes of SMEs and Micro-enterprises
 - Injection moulding
 - Traditional way of transport
 - Traditional way of packaging
 - Basic sorting process
 - Automation

Findings (Result of Delphi Study)

Items	Judged as 'very likely to be relevant' by n/- experts	Ratio (r)
Motivations		
Moving in the right direction and ahead of others	7/7	1,00
Cost saving	2/7	-0,43
Opportunity for development, growth, and expansion	3/7	-0,14
Customers' positive feedback	6/7	0,71
ISO environmental certifications	0/7	-1,00
Challenges and Barriers		
Volatility	4/7	0,14
Uncertain product quality and lack of proper documentation	7/7	1,00
Lack of proper disposal solutions	4/7	0,14
Low landfill fee	5/7	0,43
Complex and bureaucratic funding application process	2/7	-0,43
Customer skepticism	1/7	-0,71
Unrecognized problem	3/7	-0,14
Supply Chain Management		
Local suppliers	2/7	-0,43
International suppliers	1/7	-0,71
B2B model	5/7	0,43
Strategic partnership	3/7	0,71
Logistics Processes		
Injection molding	3/7	0,00
Traditional way of transport	2/7	-0,43
Traditional way of packaging	4/7	0,14
Basic sorting processes	5/7	0,43
Automation	4/7	0,14
Mixed design	5/7	0,43

Findings (Model 3)



Contributions and practical implications

- The SMEs and Micro-Enterprises in Møre og Romsdal are –
 - Partially reflowing plastics materials in their business models compared with **Ellen MacArthur** Circular Business model
 - **Sustainable Supply Chain Management** and **Reverse Logistics** are also implemented in limited ways
 - Have high motivation to move towards circular transition
 - Waste management stations should cease their landfilling and incineration process
 - Volatile engagement

Conclusion

- The study has some limitations –
 - MFA (Material Flow Analysis) model followed limitedly
 - Geographic biasness



**thank
you!**