2025

RATTAN SOLUTION

PREPARED BY

WINDESHEIM PROJECT MANAGEMENT TEAM R-SOLUTION

Made for Stichting Natuur en Milieu Overijssel

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PROJECT TEAM

Julia Vink

Julia stepped up as the project manager, guiding the process, distributing tasks, and taking responsibility for the structure of our deliverables.

Nicolò Romano

Nicolo became our lead researcher and media producer. He investigated the complexities of the rattan waste stream and was responsible for the production and editing of our content.

Pleun Horst

Pleun took on the organizational role, she structured our workflow by managing agendas, taking meeting notes, and creating a shared system for storing all our work.

Mutiara Byland

Mutiara brought a strong creative perspective to the team, working on visual materials like posters, infographics, and presentations. She also collaborated closely with Nicolo on writing the policy brief.

Diem Sopers

Focused on stakeholder communication and external engagement. He initiated contact with key individuals, sent follow-up emails, and organized meetings with stakeholders. Alongside this, he supported the rest.

INTRODUCTION

We are team R-Solution working for WaardeRing, where our goals was to develop a solution to integrate used rattan products from thrift stores into the circular economy. We aimed to find ways to reuse or repurpose the items at the highest possible level on the R-ladder, maximizing their value and sustainability. This all will be controbuting to SDG 12: responsible production and consumption.

"We hope to change the system from within, every change can get us closer to a healthier planet"

Julia Vink

OUR CHALLENGE

How can thrift shops in the Zwolle region transform the large volume of discarded rattan products into circular solutions?

As well as what recycling methods or local collaborations can reduce waste and enhance sustainability?

GOALS

- Lower rattan disposal through sustainable practices.
- Align with the principles of a circular economy.
- Transform waste into valuable resources.
- Create a continuous, eco-friendly solution.
- Minimize environmental impact.
- Maximize long-term sustainability.
- Align with the Sustainable Development Goals (SDGs).

TARGET AUDIENCE

- Thrift Stores
- Rattan manufacturers and importers
- Recycling facilities
- Waste collectors

GET TO KNOW RATTAN

Natural Rattan

Made from the stems of climbing palms found in tropical forests, natural rattan is biodegradable, lightweight, and flexible. It's commonly used in traditional furniture for its earthy look and sustainable roots. However, it’s less durable outdoors and it can be hard to recycle due to its chemical coating.

Synthetic Rattan

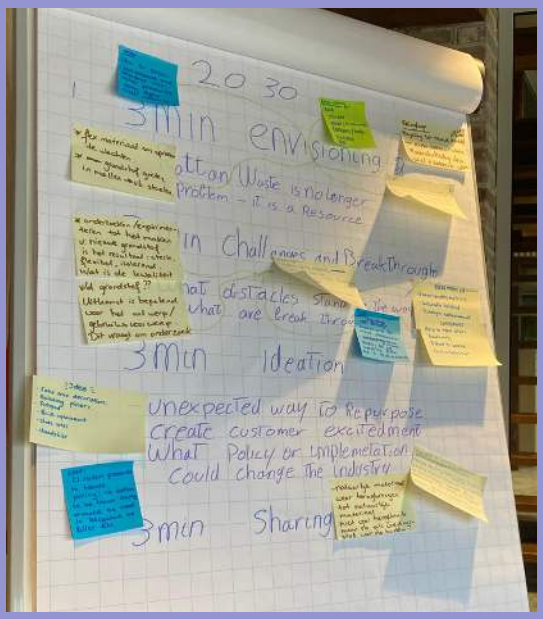
Synthetic Rattan is made of different plastics like PVC, PE, and PP. They all require distinct recycling processes. synthetic rattan is designed to mimic the look of the natural kind but offers higher weather resistance and longevity. While it's more versatile for outdoor use, it's non-biodegradable and can contribute to plastic waste if not properly processed.

SOLUTION DESIGN & DEVELOPMENT EVOLUTION

The design process began after we identified a key problem: large volumes of excess rattan being discarded into general waste, which takes up valuable space in thrift stores and ends up in landfills. This not only wastes potentially reusable material but also creates logistical issues.
To tackle this, we adopted a user-centred design approach, informed by the Symbiosis in Development (SiD) method. This guided us through a cycle of ideation, co-creation, prototyping, testing, and feedback.

Research

Our first step was research. an attempt to uncover the roots of the issue and understand why rattan is so difficult to recycle. We quickly discovered that data on rattan waste and its lifecycle is nearly nonexistent. This lack of information became one of the biggest challenges in our process.



Co-creation

The lack of information was very difficult to deal with, however, this did not stop us. We hosted multiple co-creation sessions with valuable stakeholders that worked at the thrift stores or knew about waste, lifecycles and financing. During the Co-creation sessions we brainstormed about possible outcomes of our project. One particularly valuable activity was mapping the life and waste cycle of rattan. This helped us and our stakeholders to visualise the material journey of rattan and identify intervention points for re-use and recycling. A part of the outcome can be seen on the right.

Created life cycle during co-creation

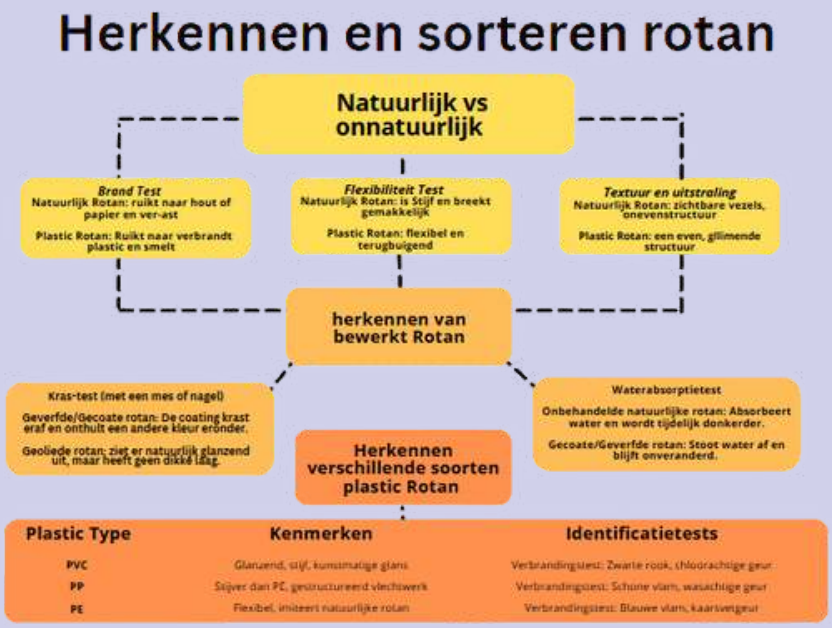
Prototypes

After the co-creation we came up with the first possible solutions. We were planning to make a flowchart that could be used in the thrift shop. How did we get there? After visiting the warehouse of the store in Ommen we saw how this worked for other materials (plastic, wood, and glass). The plan was to make one for rattan that would make it possible to give the discarded rattan a new purpose. However, we understood rapidly that it was incredibly difficult to differentiate the different materials of rattan (plastic, natural, painted, etc.).
Because of this we evolved our flowchart prototype into an interactive flowchart, which also made clear on how to see the difference between the different materials through various tests that one could do.

While this was outside of our scope, we decided to work on a policy as well. The policy brief would make it easier to recognise the type of plastic rattan. The different types of plastic rattan makes it now unable to sort and re-use. By working on implementing a coding system, what is present on normal plastic products, it would be easier to separate them.

Feedback

After finalising our prototypes we reached out to Marjolijn Mann, who created policy briefs before, with her expertise the final touches could be executed. Her feedback also helped to find possibilities on who to reach out to for the policy brief.
Bernadien Brinkhuis, who manages the thrift store in Ommen, thought our interactive flowchart was very well set up. However, she recommended us to make a smaller and more narrowed down version as this would be easier to display. As well as making a video to explain on how to find the differences between Rattan materials. There is a reason behind this; a big part of thrift store employees have a distance to the labour market, and it could be difficult to comprehend the flowchart, while a video is more clear and shows concrete examples.



Flowchart → Video

COLLABORATION & STAKEHOLDER ENGAGEMENT

Stakeholders were central to the success of our project. Their real-world insights, experience, and feedback helped validate our ideas and shaped the practical relevance of our work.

Daniel Cohan (Natuur & Milieu Overijssel)

Daniel represented our client organization. He remained engaged throughout the project by attending meetings and co-creation sessions. His feedback helped keep our work aligned with Natuur & Milieu Overijssel's mission and ensured we maintained relevance to the overarching goals of sustainability and circularity.
Together, these stakeholders played a key role in refining our thinking, shaping our deliverables, and grounding our solutions in real-world systems.

Erik Hakvoort (Noggus & Noggus)

Erik supported us in reaching additional stakeholders, such as other floor managers. His strategic perspective and input during our co-creation sessions helped align our ideas with the broader objectives of the Noggus & Noggus organization. His support helped bring credibility and structure to our stakeholder network.

Marjolijn Mann (ROVA)

Marjolijn became a guiding voice in our journey. With her deep knowledge of waste management and policy, she encouraged us to create a policy brief. Multiple meetings with her helped us refine our structure, improve clarity, and ensure the brief aligned with policy-making processes. Her feedback was instrumental in shaping the final outcome.

Bernadien Brinkhuis (Noggus & Noggus – Ommen)

As the floor manager of a large thrift store, Bernadien gave us crucial operational insights. During our visit to her store, she showed us how rattan products are handled and why they're often sent to landfills, how much space they take up, and the financial challenges of storing non-sellable items. Her involvement helped us understand the practical limitations and opportunities for reuse in the kringloop sector.

"The ideas we explored were highly relevant to the circular economy and challenged us to think beyond traditional waste streams. I appreciated the practical focus, the creative approach, and the continuous search for new possibilities, like turning waste into design. Your insights help raise awareness and inspire more sustainable production methods."
Bernadien Brinkhuis

COMMINUCATION STATEGY

Although not all stakeholders were as involved as we had hoped, we stayed flexible and kept communication open. By focusing on those who were engaged, we were still able to gather useful input that helped us shape realistic and impactful circular solutions. We learned that regular contact is important to ensure involved stakeholders. With our face to face meetings we gained most of our information that we otherwise would have overseen.

Email and calls were mainly used to keep in touch with stakeholders, send formal updates, and plan meetings.

From client meetings to co-creation sessions and thrift store visits, in-person interactions were we connected most to our stakeholders and where we gathered our most valuable insights.

Face to Face Meetings

Kringloop visits

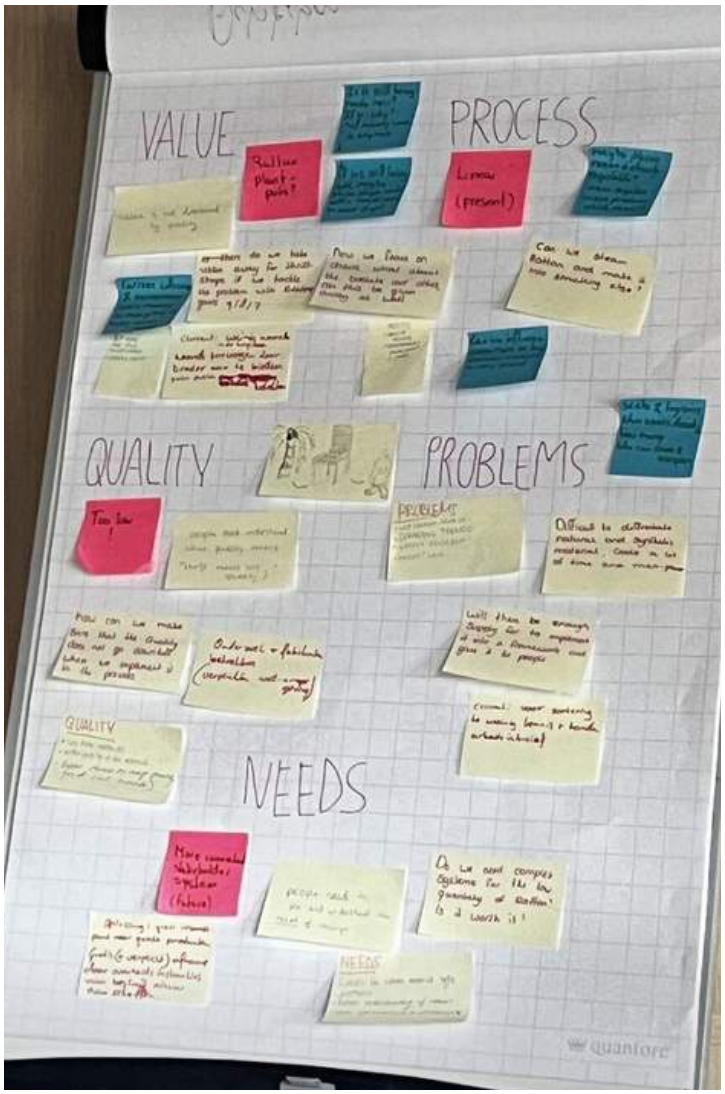
In the beginning of the project it immediately became important to us that we needed to visit the kringloop (second hand shop) as soon as possible. We had millions of questions about how the kringloop deals with similar items to rattan; what the quantity and quality of the products are and what their way of working is. With our stakeholder Bernadine Brinkhuis we were able to gain inside knowledge on the 'life' of the thriftstore. Later on we visited a store in Zwolle Zuid, to understand the difference between stores. In the location of Ommen we got a tour guiding us around the place, in Zwolle Zuid we wandered around more freely as we also were recording a video. We were able to talk to some volunteers which made our vision more inclusive.

Co-creation sessions

Our co-creation sessions took place at our clients location: Natuur & Milieu Overijssel, where we were able to make use of their office meeting rooms. During these session we had an interactive planning to keep it creative. Our team participated with the stakeholders to get on the same page of the problem. Two students were guiding the session, one note taker and two participants who supported the stakeholders during the activities. The notetaker was making sure the schedule was followed accordingly, leaving room for an extra break when needed in these intensive sessions. We made sure everyone's opinion was heard and appreciated, this encouraged others to share their expertise and ideas.

Prototyping

During the prototyping phase we had more contact with the key stakeholders that provided us with additional information for these solutions. When we had our drafts ready we scheduled in a first prototyping session with our client Daniel. He provided us with some perspectives that we had not thought of before, which helped us move forwards. After that we planned in two separate sessions with the designated team members and stakeholders. In these sessions we took a deep dive into our adjusted prototypes, making room for new feedback. This helped our team to remain open to making adjustments to make sure our final outcomes meet the requirements of the work field where it will end.



feedback

Feedback is very important to us as a team. During the co-creation sessions we always had enough time planned in the schedule to not rush over the feedback moments. We learned a lot from the feedback, not only for our product solutions but also for us individually as a project managers. We learned what worked well and we could improve during the sessions; understood what activities bring the most useful results and what we might had overseen. This helped us improve our quality of work. In our client meetings it was mainly about our progress and the feedback on it. We always made sure we had the feedback written out by our notetaker or the participants themselves, so we would not forget it. Prototyping was completely about sharing feedback, to test out the prototype and see what could be improved. Our stakeholders were really helpful in this process, they enlightened us on parts of the product that we had overseen due to lack of understanding.

Intergration of feedback

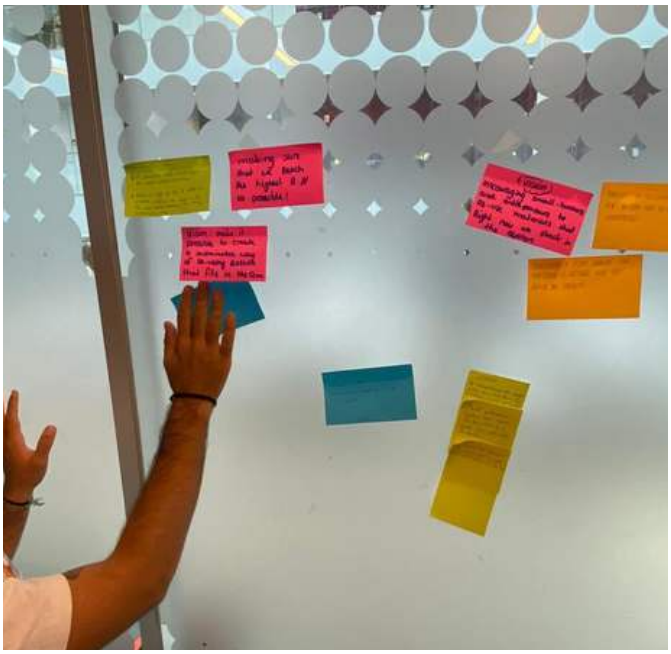
When we had received feedback from stakeholders we first gave it a bit of time to sink in, and made it a new meeting point agenda for our regular team meetings. This was done to ensure that we had enough time to go over the feedback and not rush over anything. After discussing it, we took a look at what we could use and implement into our products or process, without it going outside of our scope or boundaries. When everyone agreed we put it at the action points and divided the work.

CHALLENGES & HOW WE OVERCAME THEM

Like many student-led projects, ours came with its share of challenges. These ranged from issues in stakeholder outreach to team dynamics and knowledge gaps.

One of our biggest hurdles was the lack of existing research and data on rattan recycling in the Netherlands. Unlike other plant-based fibers like hemp or miscanthus, rattan has no defined recycling path. It is not accepted in wood waste containers and often ends up in landfill or incineration. This made it hard to find precedents or clear next steps.

Another key challenge was stakeholder engagement. In the early phases, many of our outreach efforts didn't lead to helpful contacts. Some people were hard to reach or outside the scope of our topic. However, we didn't give up. By staying persistent, following up regularly, and being clear in our communication, we eventually built valuable relationships with the right people.



"Sometimes you can be blinded by your ideal outcome that you forget the small impact you are making in the meantime"
Pleun Horst

Team communication was also tested during periods of low motivation and uncertainty. Balancing different ideas, expectations, and energy levels became difficult at times. But instead of letting it stop us, we used these moments to reflect and realign. We supported each other, redistributed tasks when needed, and allowed flexibility in our roles. This helped us push through the difficult phases and stay on track.

From these challenges, we learned a lot about ourselves, each other, and the real-world complexity of circular design. We discovered the value of co-creation with stakeholders, the power of persistence, and how to stay agile in the face of ambiguity. We also learned to bridge the gap between theory and practice and to embrace unconventional learning methods when traditional ones fell short.

RESULTS AND IMPACT

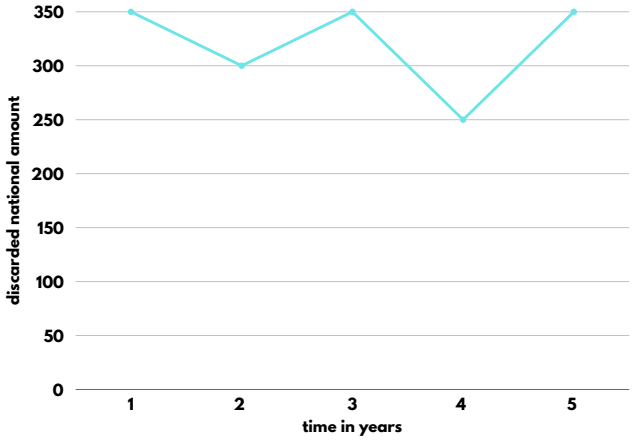
The outcomes of our project are different, and they depend on the solution we provided. In general, the result will be less waste rattan, and the remaining rattan will be recycled correctly or made part of the circular economy.

The flowchart will help the rattan be included in the circular economy. Our proposed solution is to deliver the excess rattan from the thrift stores to companies that specialise in shredding the rattan and making eco-sustainable garden material. This way, the natural rattan would get a new life by being repurposed into something new and different.

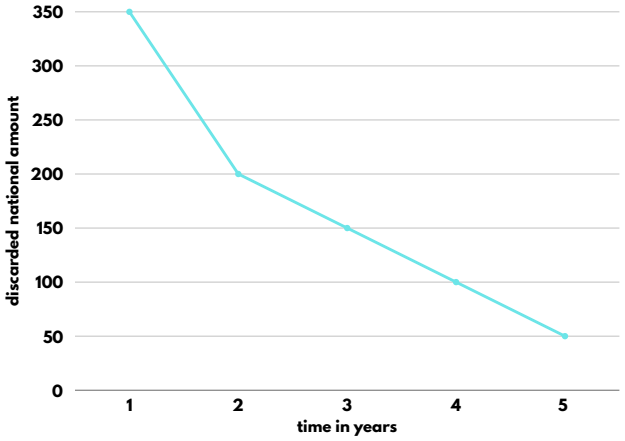
Part of the framework we are providing to the thrift stores of the province is a flowchart that we translated into a video as well, in order to be accessible by anyone. The flowchart provides clear instructions to the workers on how to recognize the different types of rattan and how to recycle it correctly.

The policy brief focuses on tackling the issue to the root of its problem. We wrote a policy brief about the material's correct labelling, focusing specifically on the rattan waste system since regulations about this are non-existent right now. This part of our project is intended for the manufacturers of rattan in The Netherlands so that they can label it correctly once the material gets to their facilities. By doing so, the products will be labelled and once the customers want to get rid of their rattan, it can be discarded in the right way, just by following the discarding instructions provided on the products. This initiative results in better understanding of the recycling procedure for both parties involved in the waste process, the costumer who knows where to get rid of the rattan, and the recycling centres that can ultimately separate the different materials, producing less general waste.

In order to achieve long term success we recommend the implementation of our proposed solution to the stakeholders involved. It is also important to keep researching the topic to come up with stronger, more effective solutions eventually.



Amount of discarded rattan in Kg in the next 5 years without the implementation of our solutions



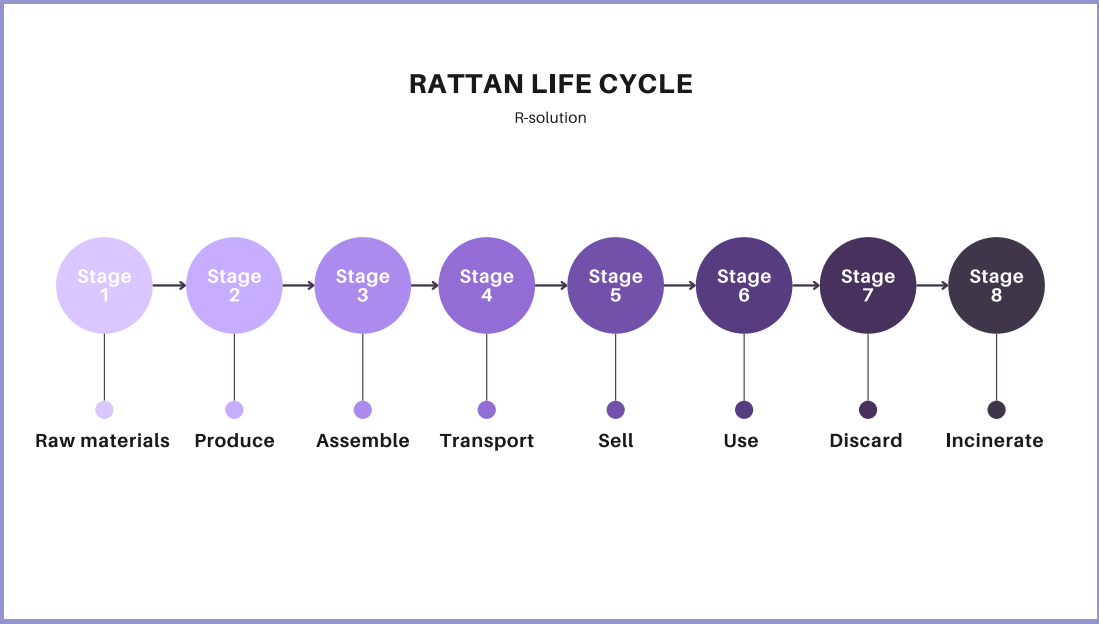
predicted impact of our solutions in the rattan waste system (estimation based on data collected by PBL Netherlands Environmental Assessment Agency)

Budgeting and implementation

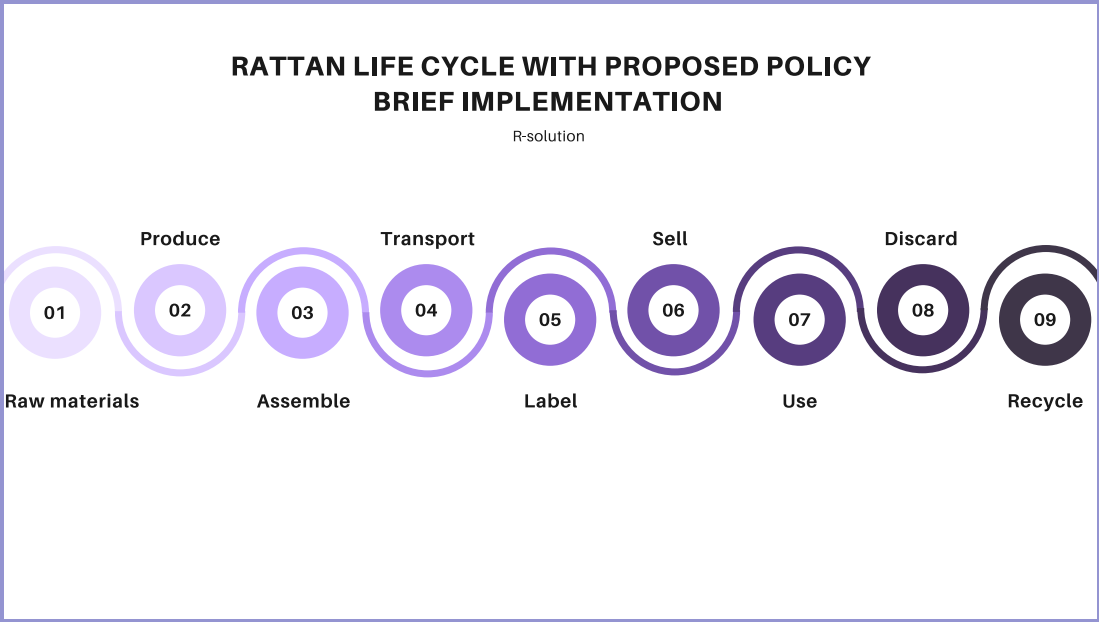
To implement our solution the stakeholder will have minimal costs. It will be necessary to invest in time in order to inform the employees about the new disposing system, they will also have to invest in a special container to contain the rattan so it is divided by the rest of the trash. These costs will be balanced out by the gains of not having to pay as much for the general waste fees, since less of it will be produced.

Life cycle comparison

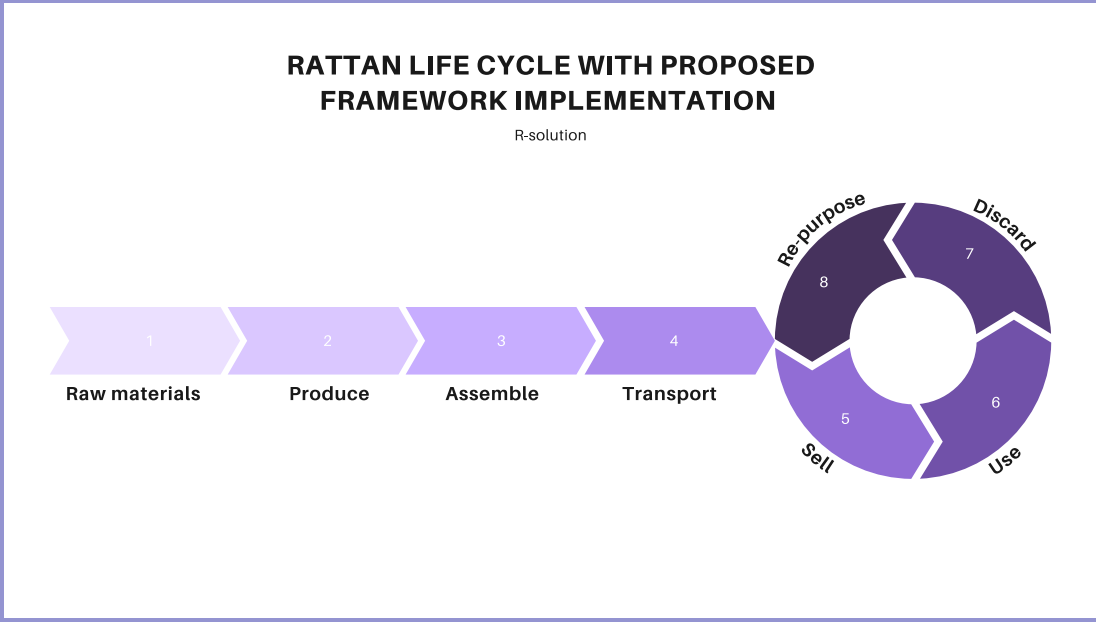
Life cycle 1: The current life cycle of rattan.



Life cycle 2: The life cycle of rattan when the proposed policies will be implemented.



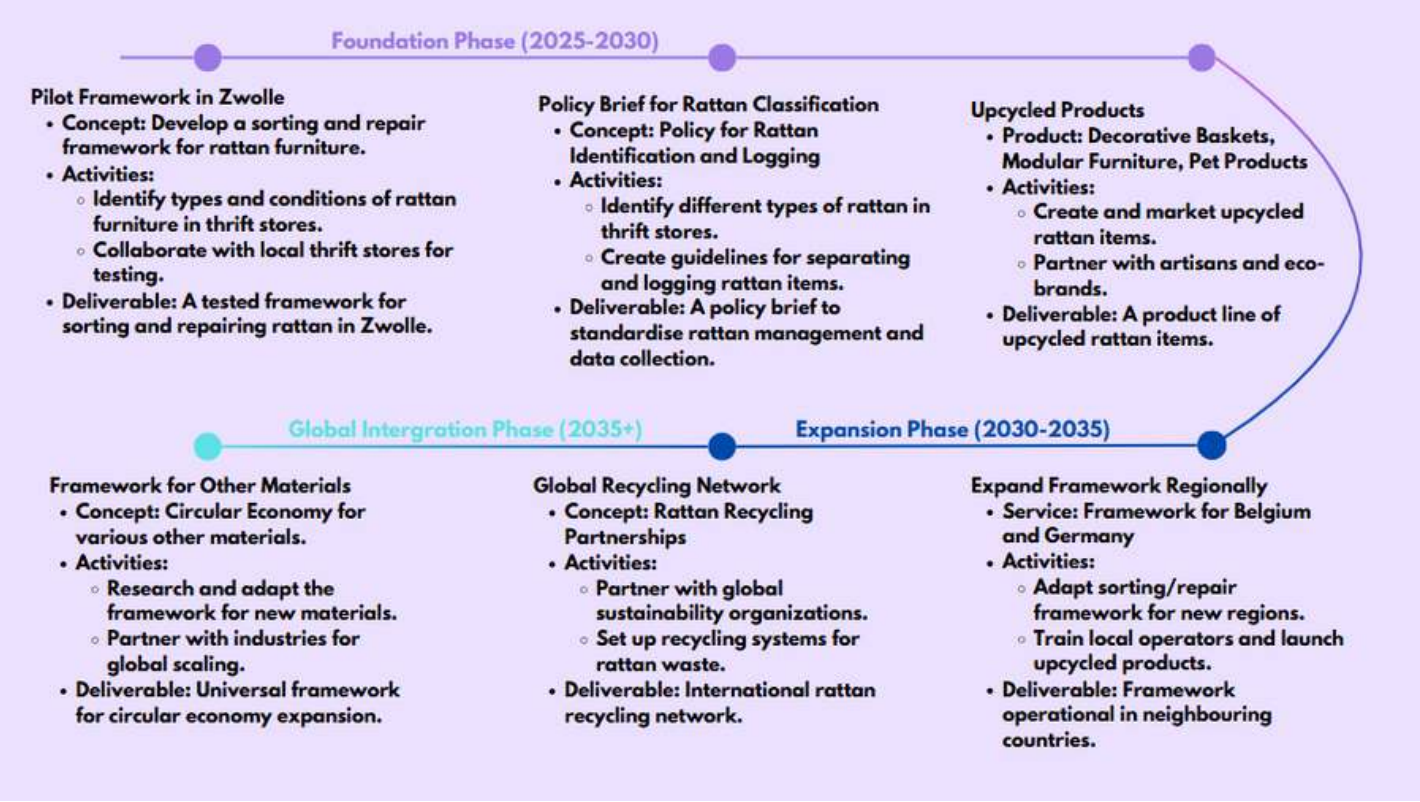
Life cycle 3: The life cycle of rattan when the framework can be used.



FUTURE EXECUTION PLAN

One of the biggest challenges we encountered was the inability to distinguish between types of rattan. Without a labeling system, re-using is nearly impossible. The labeling system that we are trying to implement would lay the foundation for circular practices.
The flowchart and accompanying video were created with accessibility in mind. Expanding their use across all thrift stores in Overijssel can create consistent practices and greater environmental impact. The usage of the flowchart can be optimised when the labeling system is completely brought into place. This makes it easier to get a higher score on the R-ladder.

If this project were to continue, the next step would be to scale our solution across more regions, while refining it based on feedback from primarily thrift store employees. Their practical experience is essential to ensure the system remains clear, efficient, and usable for everyone, including those with a distance to the labor market.
To support implementation, we recommend developing a training module for thrift store staff. This could be in the form of short videos, visual guides, and on-site workshops. Educating employees about the reason behind the circular practices, why it matters, who it helps, and how it can save our planet. In the timeline below there is a breakdown of how the future could look like.



For the future teams

The groundwork has been laid but this is only the beginning. other teams now have the opportunity to take what's been started and turn it into a model for systemic change. Use your creativity, collaborate as much as possible, and stay flexible. Circular design isn't a straight path it follows curves just like our timeline. With every small step forward, you help shape a more sustainable future. Climb the R-ladder step by step.

CONCLUSION & REFLECTIONS

Key Takeaways

Working with the SID cycle from Except really helped us rethink how we approach projects. One of the biggest takeaways was learning to slow down and not jump into action too quickly. Taking more time for deeper research gave us a better understanding of the problem and led to more meaningful results.

Using an iterative approach was super helpful,it let us try out different ideas, get feedback, and then improve things step by step. It made the process feel more flexible and less stressful, because we knew things could keep evolving.

As well as, being open to change was a big one. We learned not to hold on too tightly to one outcome or idea. Sometimes new insights came up that took us in a different direction, and that was actually a good thing. Overall, the SID cycle taught us to stay curious, be reflective, and trust the process a bit more. It really helped us grow as a team.

Reflection

Throughout the year, our team faced several challenges in project management. One of the key issues was the lack of properly planned meetings and a clear baseline for our project deliverables. Without this foundation, our early interactions with stakeholders and our client lacked structure and direction. These experiences taught us the importance of coming to meetings prepared, with a clear plan and initial framework, so that we can receive more focused and valuable feedback moving forward.

In the second semester, we realised we had unintentionally drifted from our original project scope. This lack of clarity made progress difficult and affected our team's motivation. Thankfully, after several discussions with our client and guidance from our lecturer Rik, we were able to redefine our scope and stay on track. With a clearer focus, our team regained momentum and worked more effectively toward our goals.

Despite the setbacks, these challenges ultimately made our team stronger. They pushed us to improve our communication, organisation, and adaptability. It was a valuable learning experience that we will carry forward into future projects.

PROJECT OUTPUT LINKS

Flowchart

Policy Brief

Infographic Poster

Interactive Framework

Dutch version

English version

Rattan Explanation Video