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## **Aquascaping: Principles and Practices**

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## Aquascaping: Principal and Practices

### 1. Introduction

Aquascaping is a sophisticated craft of arranging aquatic plants, driftwood, and substrates within an aquarium to create a harmonious and aesthetically pleasing underwater environment. The craft is often mentioned as underwater gardening. It transcends the traditional hobby of fishkeeping by shifting the focus from the inhabitants to the ecosystem itself. In aquascaping, the biology intersects fine art, requiring a deep understanding of aquatic ecology, water chemistry, and the principles of design. As we move further into the 21st century, aquascaping has emerged not merely as a hobby, but as a global phenomenon with significant cultural, environmental, and economic weight.

In international scenario, aquascaping has evolved into a highly competitive and prestigious sport. Major global competitions, such as the International Aquatic Plants Layout Contest (IAPLC) based in Japan and the European Aquascaping Championship, draw thousands of participants from over 60 countries annually. These international events have turned aquascaping into a bridge between cultures, fostering a global community that shares a singular language of aesthetics and environmental stewardship. Philosophically, the movement was revolutionized by the late Takashi Amano, whose "Nature Aquarium" style introduced pleasing tranquility to the West, informing the world to find beauty in the artificially created natural system.

On a national level, particularly in rapidly urbanizing countries, aquascaping has become a vital outlet for green therapy at home. In concrete built cities where access to nature is limited, a well-crafted aquascape provides a miniature, self-sustaining slice of the wilderness inside the home. This has sparked a robust domestic industry, driving the demand for specialized equipment like high intensity LED lighting, CO<sub>2</sub> injection systems, and nutrient-rich substrates. Economically, the trade of rare aquatic plants and hardscape materials has created a complex supply chain that supports thousands of local nurseries and specialized retailers. Therefore along with aesthetic point of view, the aquascaping industry has the capacity to provide entrepreneurial and economical outputs.

This booklet is aimed to provide a basic idea for aquascaping its principle, setup and types.

## **2. Principle of aquascaping**

The foundation of a successful aquascape lies in the implementation of classical art theory to a three-dimensional aquatic environment. The principle of aquascaping is governed by Golden Ratio (1:1.618) and rule of thirds, which guide the placement of focal points to avoid the sterile, artificial look of perfect symmetry. By placing primary elements like a prominent stone or a vibrant coloured plant slightly off-center, the artist should create a dynamic environment that feels natural to the human eye. Furthermore, the concept of perspective and depth is utilized to break the artificial glass box constraint. This is achieved through a sloped substrate i.e. rising from front to back and the strategic graduation of textures, where large, coarse elements are placed in the foreground while finer, softer plants were placed into a distance, mimicking the atmospheric haze of a real landscape.

## **3. The concept of nature aquarium**

Revolutionized by Takashi Amano, the nature aquarium concept shifted the hobby of aquascaping from a purely decorative pursuit to a philosophical one which is influenced by Japanese aesthetic of Wabi Sabi. This principle finds beauty in imperfection and the transience of nature, favoring wild, asymmetric growth over the rigid, manicured rows of older European styles. Instead of treating plants and fish as separate entities, the Nature Aquarium views the tank as a singular, self-sustaining ecosystem. In this conceptual framework, the flora also acts as a living filter, where the rapid photosynthesis of healthy plants outcompetes algae for nutrients and provides a high oxygen environment that mimics the pristine mountain streams of the wild.

## **4. The biological equilibrium**

An aquascape is a living masterpiece that depends entirely on the Biological Triangle of Growth which facilitates the balance between light, carbon dioxide (CO<sub>2</sub>), and nutrients. The concept is simply the one of equilibrium where light acts as the accelerator of the system, determining the speed of photosynthesis, while CO<sub>2</sub> and

liquid fertilizers provide the essential building blocks. If the light is too intense without sufficient carbon or nutrients, the system crashes, leading to algae blooms and plant decay. Understanding this concept is what allows an aquascaper to maintain a high-tech aquascape with demanding carpeting plants, ensuring that the biological engine of the aquarium remains in a state of stable, lush growth.

## 5. The structural layouts of an ideal aquascaping

The conceptual structure of an aquascape usually follows three types of geometric archetypes i.e. concave, convex, or triangular. A Concave layout features high vegetation on the sides with a low open space in the middle, creating a canyon or pathway that draws the viewer's eye toward a distant vanishing point. Conversely, a convex layout places the highest mass in the center, tapering down toward the edges to create an island or "mountain" effect. The Triangular layout is perhaps the most dynamic, following a slope from one high corner down to the opposite low corner. These typologies serve as the skeleton of the design, providing a clear framework upon which the artist can layer different species of plants and hardscape materials.

## 6. Essential equipment required for aquascaping management

To maintain a professional aquascaping few essential items are required. The items and its purposes are mentioned below :

<b>Instruments</b>	<b>Purpose</b>	<b>Specific Usage</b>
<b>Pinsettes (Straight)</b>	Precise Planting	Used to grip the base of stem plants or root systems and insert them vertically into the substrate without disturbing surrounding soil.
<b>Pinsettes (Curved)</b>	Hard-to-reach Planting	Essential for planting in tight crevices, underneath overhanging driftwood, or behind large stones where a vertical approach is impossible.
<b>Curved</b>	General	The all-purpose tool for pruning stem plants.

<b>Scissors</b>	Trimming	The curve allows the user to cut at specific angles to encourage bushier regrowth.
<b>Wave Scissors</b>	Foreground Maintenance	Features a unique "S" shape designed to trim low-growing "carpet" plants (like <i>HC Cuba</i> ) perfectly flat while keeping the user's hand at a comfortable angle.
<b>Spring Scissors</b>	Delicate/Nano Pruning	Small, spring-loaded shears used for high-precision tasks like thinning out fine mosses or trimming plants in extremely small (nano) aquariums.
<b>Substrate Spatula</b>	Grading and Leveling	Used to create dramatic slopes (high in back, low in front) and to smooth out landslides in the soil after planting or water changes.
<b>Algae Scraper</b>	Glass Maintenance	Equipped with a metal or plastic blade to remove stubborn algae from the viewing panes without scratching the glass or getting hands deep in the water.
<b>Sand Flattener</b>	Cosmetic Detailing	A small, precise spatula used specifically for detailing cosmetic sand pathways and ensuring the transition between soil and sand remains crisp.
<b>Aquascaping Glue</b>	Plant Attachment	A cyanoacrylate-based gel used to instantly bond epiphytic plants (like <i>Anubias</i> or <i>Java Fern</i> ) and mosses directly onto rocks or driftwood.

Proper care and maintenance should be given to these goods for better longevity and efficiency. Even though most high-quality aquascaping tools are made of surgical grade stainless steel but they are not entirely immune to the corrosive effects of aquarium water.

## We should follow following tips for better care of the items :

- i. **Rinse and Dry:** Always rinse your tools in tap water after use and dry them immediately with a microfiber cloth.
- ii. **Avoid Salt:** If you are working in a brackish or saltwater environment, use tools specifically coated for marine use, as standard stainless steel will rust quickly.
- iii. **Honing:** Periodically check the blades of your scissors. If they start to "tear" plant tissue rather than cutting cleanly, they need sharpening to prevent plant decay at the cut site.

## 7. Items required for preparing a aquascaping

To develop a professional aquascaping we should select accurate, professional grade items which require lesser exchange.

Category	Item / Good	Purpose in Design	Usage & Application
<b>Substrate System</b>	<b>Active Aqua-Soil</b>	Nutrient storage and pH buffering.	The primary layer for root-feeding plants; usually sloped for depth.
	<b>Power Sand / Base Layer</b>	Porous media for bacterial colonization.	Placed at the very bottom to prevent substrate compaction and anaerobic zones.
	<b>Cosmetic Sand</b>	Visual contrast and highlighting.	Used for "paths" or "rivers" to separate different plant groupings.
<b>Hardscape Elements</b>	<b>Main Stones</b> (e.g., Seiryu, Dragon)	Structural skeleton and focal points.	Arranged according to the Golden Ratio to create mountains or cliffs.

	<b>Driftwood</b> (e.g., Spiderwood, Bogwood)	Adding verticality and organic texture.	Mimics tree trunks or roots; often the base for attaching mosses.
	<b>Hardscape Glue / Epoxy</b>	Structural integrity.	Bonds heavy rocks or delicate wood pieces together for a permanent layout.
<b>Living Flora</b>	<b>Carpeting Plants</b>	Creating an underwater lawn.	Small, low-growing species that cover the foreground soil.
	<b>Epiphytic Plants</b>	Detail and texture on hardscape.	Plants like <i>Anubias</i> spp or <i>Bucephalandra</i> sp that are glued directly to wood or rock.
	<b>Stem &amp; Midground Plants</b>	Depth and color variations.	Taller plants used to hide equipment and provide lush background volume.
<b>Technical Equipment</b>	<b>Full-Spectrum LED</b>	Powering photosynthesis.	High PAR lighting is required for red colors and compact growth.
	<b>Pressurized CO<sub>2</sub> System</b>	Accelerating plant metabolism.	Includes the cylinder, regulator, and a fine ceramic diffuser to dissolve gas.
	<b>External Canister Filter</b>	Biological and mechanical filtration.	Keeps the tank clear while allowing the use of suction pipes.
<b>Maintenance</b>	<b>Liquid</b>	Providing N-P-K	Daily or weekly dosing to

<b>&amp; Finish</b>	<b>Fertilizers</b>	and Micronutrients.	ensure plants do not suffer from deficiencies.
	<b>Lily Pipes (Glass/Steel)</b>	Aesthetic water intake/outtake.	Replaces bulky plastic pipes to make the equipment invisible.

## 8. Budget of a 20 gallon aquascaping unit

The estimate of an aquascaping relies on the quality of goods and the level of setup i.e. beginner level or expert level. At entry level the cost of an aquascaping may vary between 30-40 thousand rupees where primarily budget friendly brands are used. In expert level setups the cost may be as high as 55-75 thousand rupees with special focus on high end, quality products. The detailed estimate is mentioned below

- Hardware and equipment/fixed cost

<b>Item</b>	<b>Estimated Price (INR)</b>	<b>Recommended Brands</b>
<b>Clear Glass Tank (Low Iron)</b>	₹3,500 – ₹5,500	Sunsun, FireGarden, Local Starphire
<b>Full Spectrum LED Light</b>	₹6,000 – ₹12,000	Chihiros (All/WRGB), Week Aqua, Netlea
<b>External Canister Filter</b>	₹4,500 – ₹8,000	SunSun, Eheim, Dophin
<b>Pressurized CO2 Kit (2kg)</b>	₹7,000 – ₹10,000	Ista, UpAqua, or Local Cylinder kits
<b>Glass Lily Pipes</b>	₹1,200 – ₹2,500	Generic Glass or Stainless Steel
<b>Aquascaping Tool Kit</b>	₹1,500 – ₹2,500	Stainless Steel sets (Amazon/Local)

- Biological items and hardscapes/ consumables

Item	Estimated Price (INR)	Details
<b>Aqua Soil</b> (9 Liters)	₹2,500 – ₹4,500	ADA Amazonia, Tropica, or Tropiland
<b>Hardscape Stones</b> (5-10kg)	₹1,000 – ₹2,500	Seiryu, Dragon, or Lava Rock (₹150-250/kg)
<b>Driftwood</b>	₹800 – ₹2,500	Spiderwood or Bogwood
<b>Tissue Culture Plants</b>	₹3,000 – ₹6,000	10-15 pots (₹250-450 per pot)
<b>Bacterial/Root Tabs</b>	₹500 – ₹1,200	Prodibio or API

## 9. Advantages of aquascaping

- Stress relief

One of the most profound advantages of aquascaping is its impact on mental health, often serving as a form of underwater meditation. Scientific studies have shown that observing a lush, green aquatic environment can significantly lower cortisol levels and reduce blood pressure. The act of green therapy through manually trimming plants and maintaining the delicate balance of the tank provides a mindful escape from the stresses of modern life. By bringing a slice of the natural world into urban living spaces, aquascaping satisfies the human need for biophilia, fostering a sense of tranquility and emotional stability within the home.

- Educational and Scientific Insight

Aquascaping serves as a practical, hands-on demonstration for various scientific disciplines, including biology, chemistry, and ecology. A successful aquascaping

hobbyist must develop a knowledge of the nitrogen cycle, the chemistry of water buffering (pH, hardness, alkalinity), and the specific nutritional requirements of various plant species. This deep engagement often leads to a greater environmental consciousness.

- Aesthetic Sophistication and Living Art

Unlike home decors, an aquascape is a four dimensional piece of art that evolves and matures over time. It offers a unique design element that introduces light, organic texture, and fluid movement into our drawing room. An aquascape can be custom designed to complement and elevate the architectural aesthetic of any space.

## 10. Aquascaping design styles

There are various famous and established designs of aquascaping which are as follows

Style Type	Primary Characteristic	Key Elements	Visual Aesthetic
<b>Dutch Style</b>	<b>Botanical Diversity</b>	High plant density, variety of colors, "plant streets" (rows).	A lush, orderly underwater garden; no rocks or wood.
<b>Nature (Ryoboku)</b>	<b>Driftwood Focus</b>	Use of driftwood/roots as the main structure, moss-covered wood.	Recreates a slice of an ancient forest or riverbank.
<b>Nature (Iwagumi)</b>	<b>Stone Minimalism</b>	Odd number of stones (3, 5, 7), low "carpet" plants.	Zen-like, serene, mimicking mountain peaks or grasslands.
<b>Jungle Style</b>	<b>Wild &amp; Untamed</b>	Dense, broad-leaved plants, floating plants, limited open space.	A raw, overgrown tropical look with dappled light.

<b>Biotope</b>	<b>Ecological Accuracy</b>	Native species only, specific water parameters, leaf litter.	A scientific "snapshot" of a real-world river or lake.
<b>Paludarium</b>	<b>Semi-Aquatic</b>	Combines land (terrestrial) and water (aquatic) sections.	Recreates a swamp, marsh, or tropical riverbank.
<b>Taiwanese Style</b>	<b>Narrative Depth</b>	Terraced levels, paths, and small decorative figurines.	A whimsical, story-driven landscape with forced perspective.

## Image gallery of Aquascaping styles

### Dutch style aquascaping



### Ryoboku style aquascaping



### Iwagumi style aquascaping



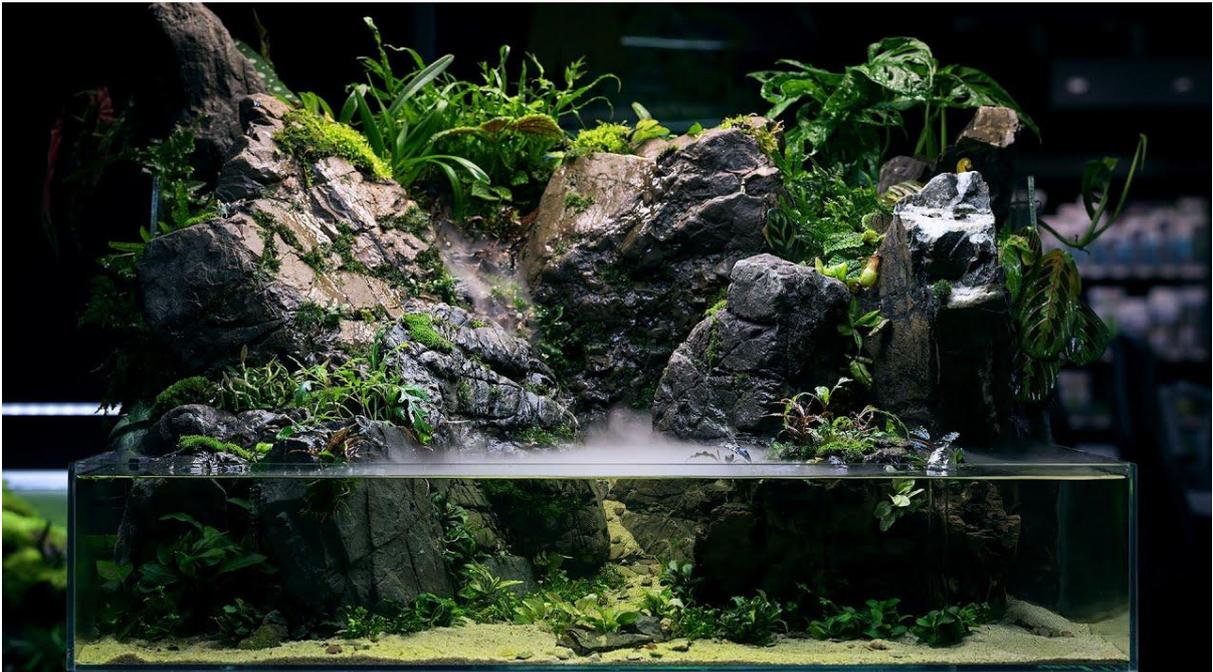
### Jungle style aquascaping



### Biotope style aquascaping



### Paludarium style aquascaping



## Taiwanese style aquascaping





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