**THE POSITIVE AND NEGATIVE EFFECTS OF CLONING.**

Cloning is the process of producing the exact genetic copies of a living thing. It can occur naturally or it can be done in the laboratory artificially through techniques such as somatic cell nuclear transfer where a viable embryo is produced from a somatic cell as seen in Dolly the sheep and molecular cloning where a DNA sequence is cleaved into segments using restriction enzymes, litigated by DNA ligase and transfected into a cloning vectors into a host cell after which screening will be done to select those successfully transfected by the foreign DNA.

**POSITIVE EFFECTS OF CLONING**

**a) Aid for diseases through therapeutic cloning**

It helps in creation and regeneration of new tissues and organs from a scratch eliminating problems such as scarcity of organs during organ transplant and immune rejection as organs can be cloned from patient specific parts eg the skin sections and blood arteries.

Theraputic cloning has also been used in creating animal models that can be used in scientific investigations eg mouse models for parkinson's disease important in studying its pathophysiology and treatment efficacy.

Stem cell therapy has also been involved in management of certain conditions. Embryonic stem cells due to their pluripotent, differentiation and self generation property have been harvested from the blastocyst 8 days after conception and cloned to produce organs for conditions such as kidney and liver failire. This stem cells have also been used to produce endocrine cells for the production of hormones such as insulin in the management of diabetes mellitus.

**b) Increasing agricultural production by creation of genetically modified organisms.**

This is done by introducing a foreign DNA into a plant or animal to acquire a particular trait to ensure quality food production. Plants have been in cooperated with specific gene sequences encoding proteins with insecticidal activities from soil bacteria *Bacillus*

thuringesis.This makes modified plants such as maize and cones pest resistant reducing the need for pesticides use encouraging large scale farming. cloning also produces crops that are drought resistant, better nutrition and longer storage life.

Transgenic livestock eg pigs sheep and cattle have also been produced that are drought resistant, quality body growth and wool growth and increased milk composition that has increased production efficiency and range of manufacturing option.

**c) Human cloning in children production.**

Human cloning has played an important role in allowing couples with infertility cases to have biologically related children reducing cases of relying on foreign gametes that would produce children of different genetic variations from the parents.

It has also helped in reducing the risk of couples having ressecive gene to a particular genetic disorder produce children that are healthy without inheriting the defective gene without relying on donar gametes, prenatal genetic diagnosis and elimination of afflicted embryos.

Human cloning has also allowed for individuals of great talent, beauty or traits that is believed to be based on individuals of desirable or superior traits eg musicians.

Obtaining rejection proof transplant has also been made possible via cloning.

**d) Prevents extinction of certain species.**

Cloning is important in preservation of species that are endangered of extinction eg genetically modified plants have a quick generation time that allows collection and sowing of seeds that allows researchers to understand the organism as living things rather than just looking at their remains.

**NEGATIVE EFFECTS OF CLONING**

Although cloning is beneficial in various areas such as agriculture, marriages and therapy, there are several arguments against it ghat includes;

**a) It has been considered unethical**

Cloning has been considered unethical as it violates freedom, autonomy and infviduality. Therapeutic cloning reduces suffering among sick individuals but needs development of embryos in test tubes, a controversial process in collecting embryonic stem cells that is considered unethical regardless of whather they are used to treat or damage individuals.

Futhermore cloning requires female eggs hence reproduction can continue given that female eggs are present meaning females can be fertile without males rendering male procreation unimportant that is against thetradition of family ethics.

Although human cloning may be the only way for some couples to get a genetically own child, it is considered to breach moral aspects of reproductive autonomy. Argument are there that clones lack individuality as they are saddled with a genotype that already lived, lack genetic uniqueness as it creates preexisting DNA compromising the cloned child dignity depriving him or her right to genetic identity. The clones are also believed to be treated in an undignified manner by their creators and they would be damaged by societal expectations. They are also exposed to some sort of harm both physically, socially and mentally.

Reproductive cloning introduces higher likelihood of life loss and may lead to suffering as cloned embros tend to be large causing painful birth that demands cesarean section.

**b) It eliminates genetic biodiversity.**

Cloning involves removing the nucleus of an ancestral cell that is fused with another cell eg skin cell so that the fused cells only contain genes from the animal they are cloning.

**c) It promotes discrimination.**

Discrimination occurs in today's world either racially or socially. Cloned individuals may feel less human in terms of individuality, genetic identification, autonomy and freedom as compared to other individuals as they may have been deprived of them during the process of their creation.