

# Vote:142 National Agricultural Research Organisation

## V1: Vote Overview

### I. Vote Mission Statement

To innovate for sustainable agricultural transformation

### II. Strategic Objective

- a. Client and impact-oriented, market responsive agricultural sector research agenda developed and implemented
- b. Capacity and efficiency of public and private agricultural sector research service provider teams to respond to client needs and market opportunities improved.
- c. Infrastructural and financial sustainability capacities to support and facilitate agricultural research enhanced and strengthened
- d. Mechanisms for contributing to agricultural research sector policy formulation and development strengthened.
- e. Quality assurance procedures in the NARS established and implemented.

### III. Major Achievements in 2018/19

Performance summary on NARO Key Performance Indicator

16 New varieties submitted to Variety Release Committee

55 Production technologies generated or released

21 Research studies under CGS

16 Technological innovation platforms established/supported

70 Technological innovations delivered to uptake pathways

A. Details of Generation of agricultural technologies

1. 16 new varieties submitted to Variety Release Committee (2 cotton varieties, 2 beans , 4 maize hybrids, 2 Matooke hybrids, 6 potato varieties.
  - 2 yellow rust resistant wheat and 2 advanced maize lines ready for advancement to the NPTs
  - 3 highland Sorghum Varieties will be submitted for release. Data compiled on multilocation trial performance.
2. 3 Mandi Plus cassava seed treatment technology for enhanced germination and vigour developed
3. 2 cotton varieties for official release
4. 1 cotton effective foliar fertilizer and 1 Cotton biopesticide;
5. Documented information on impacts of fish cages on water quality and biota at SON cage fish farm for Q1;
6. Information on occurrence, abundance and diversity of microplastics in sediment, water and fish documented;
7. Three months ecological status and the water quality in Lakes: Mburo, Edward, George, Saka and Victoria (Murchison Bay and Napoleon Gulf) documented;
8. 2 (Combustibility of saw dust fuel lighters increased by 5% through improved hydrocarbon-sawdust blending.
9. 300 packets of high value fuel lighters of improved blend of wax and saw dust produced.
10. 200liters of juice from oyster mushrooms cultured at different concentrations of cinnamon, ginger, sugar and tea leaves produced for nutritional lab analysis)
11. In potato, preliminary results show that 5 out of 18 Dutch varieties are adaptable to Ugandan condition with capacity to yield over 30T/ha.
12. Three adjuvanted antitick vaccine trial batches developed;
13. one cocktail antitick vaccine trial batch developed;
14. One protocol for pest management in stingless bee colonies;
15. One protocol on management of brucellosis in dairy cattle;
16. Three potential grazing lines for lablab identified
17. 1 community control scheme for brucellosis in dairy cattle in DRC, 1. community control scheme for brucellosis in dairy cattle in S. Sudan, 1. community control scheme for brucellosis in dairy cattle in Uganda.
18. 3 elite forage lines availed to farmers; management guide for brucellosis;
19. 3 farm-specific feed rations developed and availed to farmers;
20. elite mubende bucks availed to farmers
21. Laboratory Analysis (DNA analysis) of 60 tea accession done. All the 60 tea accessions showed good and high quality DNA as per the laboratory analysis

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22. Laboratory Analysis of 22 tea accessions for biochemical attributes of tea clones has been determined. Preliminary results show all the 22 accessions picked are fast fermenters implying they are good for black tea and not green tea

23. 1 (Draft protocol “Rearing, releasing and monitoring establishment of (*Cleruchoidesi nockae*) in Uganda” developed. 2 T.brimblecombei hotspots for release of the parasitoid established in Western and S.W. Uganda (Request to FABI for provision of breeding population of *C.nockae* bio-agents okayed).

24. 1 (Design drawings of the wood waste fueled cook stove prototype produced).

25. Preparatory procedures for implementation of options for Control of Red gum Lerp Psyllid and Bronze bug Eucalyptus Pests on going).

### B. Details of Strengthening Research-Extension interface

#### (a) Multistakeholders Innovation Platforms supported

1. One bean MSIP in Gombe strengthened(NACRRI)

2. 3 (Official endorsement of commodity Innovation Platforms (IPs) by Kapchorwa and Manafwa district local governments);

3. Technical support extended to 18 private nursery operators supplying fodder planting material to dairy IPs in Manafwa/Namisindwa and Kapchorwa districts).

4. 2 (Technical backstopping provided to Mt. Elgon Women in Coffee IP (to ensure quality standards required by Monastery Coffee, an Australian premium coffee buyer);

#### (b) Improved technologies promoted

5. 8 bean varieties including 5 high iron bean varieties promoted. (NACRRI)

6. 3 iron-rich bean and 10 drought tolerant maize varieties promoted through the Technology for African Agriculture Transformation initiatives(NACRRI)

7. 17 cassava processing equipment deployed with 12 farmers' groups, (NACRRI)

8. Mechanized cassava planting demonstrated on 20 acres, (NACRRI)

9. Mechanized cassava planting promoted by planting 147 acres of cassava on farmers' fields,

10. 3 cassava mechanization platform in Kigumba, Apac and Serere(NACRRI)

11. Vines of 3 sweet potato varieties distributed to 80,000 secondary beneficiary farmers in 3 districts, (NACRRI)

12. 60 sweet potato vine multipliers trained in agribusiness(NACRRI)

13. Quality assured seed of Nile tilapia, the African catfish and mirror carp produced;

14. 1500 seedlings of *E.camaldulensis* for rearing bronze bug and red gum lerp psyllid acquired).

#### (c) Public engagements

15. Hosted and Participated in World Food Day celebrations at Nabuin ZARDI.

16. Participated in outreach events: Jinja Agricultural celebrations, Harvest money

17. 10 outreach events held and 5000 stakeholders reached, (NACRRI)

18. One public debate held involving 3 universities on biotechnology involving 3 universities and over 3000 students and educators engaged(NACRRI)

#### (d) Distribution of Planting materials and Empowerment of stakeholders

19. 1 Clean seed of 3 cassava varieties (NASE 14, NASE 19, NAROCASS 1) multiplied on 18 acres in 2 districts,

20. 2 Virus-indexed vines of 4 sweetpotato varieties (NASPOT 8, NASPOT 12-O, NASPOT 13-O, Dimbuka-Bukulula) multiplied,

21. 252 cassava farmers trained in 2 districts, (NACRRI)

22. 392 farmers and 3 partners trained on CBSD root necrosis identification. 17 cassava processing equipment tested for efficiency and 48 farmers trained on operating and maintenance. (NACRRI)

23. At least 80 farmers trained in cassava husbandry, disease management and value addition, equipment for processing cassava tested. 100 farmers taken for farm tours and exposure visits. (NACRRI)

24. 600 seed potato farmers trained on quality seed potato production and management using. (KaZARDI)

25. Five Local seed (potato seed production) business groups trained in general crop agronomy and agribusiness. (KaZARDI)

26. Five groups of Farmers trained in gender related issues, quality seed production, and Linked to DAOs and MAAIF for quality assurance. (KaZARDI)

27. 100 farmers trained in agronomic practices of striga resistant sorghum and millet varieties (AbiZARDI)

28. 240 women trained in agronomic practices of striga resistant sorghum and millet varieties. (AbiZARDI)

29. Community seed bank established in Hoima district.

#### (e) Mother gardens maintained

30. Tea, Banana, Coffee

### C. Strengthening agricultural research capacity

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- Tea nursery expansion to accommodate specialty tea has been done
- 2 (Detailed plans and designs for refurbishment and establishment of the National Forestry Research Laboratories at Kifu, Mukono developed; ii)

## IV. Medium Term Plans

A. NARO continue to conduct and promote crop research targeting men, women, youth and the elderly members of the farming communities of Uganda.

1. Development of adapted crop varieties and appropriate crop management practices for diverse agro-ecologies in Uganda;
2. Developing and applying innovative and high throughput breeding tools and techniques for increasing the rate of genetic gains in crop breeding pipelines;
3. Production of early generation seed and development of novel seed systems pipelines with high quality control standards for vegetative propagated crops;
4. Understanding pathogen and pest dynamics and developing appropriate disease management strategies;

B. A. NARO continue to conduct and promote livestock research targeting men, women, youth and the elderly members of the farming communities of Uganda.

1. Vaccine development and evaluation for ticks and tick-borne diseases (TTBD) (a) Subolesin vaccine; (b) GST vaccine;
2. Development and promotion of bio-acaricide based on native entomo-pathogenic fungal strains;
3. Development and promotion of Ethno-veterinary drugs for Nematode, Cestode and Trematode worms;
4. Development of disease diagnostic kits
5. Development and promotion of LAMP kit for detection of Trypanosomiasis
6. Development and promotion of devices for on-farm detection of FMD, CBPP, Brucellosis, E. coli in milk;
7. Development and maintenance of elite indigenous goat and chicken lines
  - (a) Elite Mubende goats with better growth rates, twinning ability, mature weight
  - (b) Elite chicken lines with better meat and egg production abilities.
8. Development of low cost dietary rations for enhanced meat and milk production;
9. Development and promotion of Calf pellets, heifer pellets, cow pellets, Beef fattening rations and Aflasafe poultry rations;
10. Development of technologies to optimize forage production and conservation;
11. Development and promotion of Inoculation, pollination and fertilizer regimes for Alfalfa;
12. Microbial suspensions to enhance fermentation qualities of grass-legume silage;
13. Rehabilitation of degraded pasturelands;
14. Forage breeding for enhanced productivity of grasses and legumes (Lablab, Brachiaria)
15. Forage seed production and distribution (Chloris gayana, Lablab, Alfalfa)
16. Revival of the semen production, supply and delivery in collaboration with NAGRIC&DB;
17. Management of honeybee disease.

C. NARO will continue to conduct and promote environmental research (Forestry, Climate and Soil, Land, water Management) in the farming communities of Uganda.

1. Development and promotion of technologies for Climate change adaptation, mitigation and resilience of farming systems;
2. Development and promotion of technologies for Trees and medicinal plants for health, food and nutrition security;
3. Development and promotion of technologies for Timber and wood research for construction, furniture and biomass energy;
4. Development and promotion of technologies for Forest (plant) ecology and natural resource economics;
5. Development and promotion of technologies for Plantation and natural forest (biodiversity) conservation and management;
6. Development and promotion of technologies for Sustainable land use and management

D. NARO will continue to conduct and promote environmental research in fisheries management in the farming communities of Uganda.

1. Development and promotion of technologies for Climate change adaptation, mitigation and resilience of aquatic systems;
2. Development and promotion of technologies for Fish feeds and fish for health, food and nutrition security;
3. Development and promotion of technologies for Water ecology and natural resource economics;
4. Development and promotion of technologies for Marine conservation and management;
6. Development and promotion of technologies for Sustainable marine use and management

E. NARO will continue to conduct and promote research and Investment areas in cross cutting areas targeting men, women, youth and the elderly members of the farming communities of Uganda.

1. Development and promotion of technologies for Increasing technology uptake by strengthening research-extension interphase;
2. Conduct appropriate gender responsive policy, socio-economic analyses and advocacy;

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3. Improving communication, information and knowledge management relevant to diverse technologies and innovations;
4. Enhancing and sustaining the human and infrastructure capacity for research for impact;
5. Improving the effective of research management, and M&E to optimise return on investment.

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## V. Summary of Past Performance and Medium Term Budget Allocations

Table 5.1: Overview of Vote Expenditures (US\$ Billion)

		2017/18 Outturn	2018/19		2019/20	MTEF Budget Projections			
			Approved Budget	Expenditure by End Dec		2020/21	2021/22	2022/23	2023/24
<b>Recurrent</b>	Wage	22.472	22.472	11.236	22.472	23.596	24.776	26.014	27.315
	Non Wage	7.311	7.099	3.554	19.777	22.743	27.292	32.750	39.300
<b>Devt.</b>	GoU	7.122	32.783	3.477	39.183	47.020	47.020	47.020	47.020
	Ext. Fin.	45.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000
<b>GoU Total</b>		<b>36.906</b>	<b>62.354</b>	<b>18.267</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>
<b>Total GoU+Ext Fin (MTEF)</b>		<b>82.445</b>	<b>62.354</b>	<b>18.267</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>
	Arrears	0.007	0.114	0.109	0.000	0.000	0.000	0.000	0.000
<b>Total Budget</b>		<b>82.453</b>	<b>62.468</b>	<b>18.376</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>
<b>A.I.A Total</b>		<b>5.590</b>	<b>7.146</b>	<b>1.592</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
<b>Grand Total</b>		<b>88.043</b>	<b>69.614</b>	<b>19.969</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>
<b>Total Vote Budget Excluding Arrears</b>		<b>88.036</b>	<b>69.500</b>	<b>19.859</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>

## VI. Budget By Economic Classification

Table V6.1 2018/19 and 2019/20 Budget Allocations by Item

<i>Billion Uganda Shillings</i>	2018/19 Approved Budget				2019/20 Draft Estimates		
	GoU	Ext. Fin	AIA	Total	GoU	Ext. Fin	Total
<b>Output Class : Outputs Provided</b>	<b>43.883</b>	<b>0.000</b>	<b>7.146</b>	<b>51.029</b>	<b>60.965</b>	<b>0.000</b>	<b>60.965</b>
211 Wages and Salaries	23.565	0.000	0.944	24.509	24.796	0.000	24.796
212 Social Contributions	2.230	0.000	0.000	2.230	2.230	0.000	2.230
213 Other Employee Costs	2.162	0.000	0.000	2.162	2.310	0.000	2.310
221 General Expenses	5.518	0.000	1.397	6.916	11.210	0.000	11.210
222 Communications	0.861	0.000	0.039	0.900	0.652	0.000	0.652
223 Utility and Property Expenses	0.602	0.000	0.451	1.053	2.409	0.000	2.409
224 Supplies and Services	2.135	0.000	1.601	3.736	6.199	0.000	6.199
225 Professional Services	1.049	0.000	0.004	1.053	1.573	0.000	1.573
226 Insurances and Licenses	0.317	0.000	0.004	0.321	0.471	0.000	0.471
227 Travel and Transport	3.416	0.000	0.680	4.096	5.979	0.000	5.979
228 Maintenance	1.965	0.000	2.015	3.980	3.060	0.000	3.060
273 Employer social benefits	0.061	0.000	0.010	0.071	0.076	0.000	0.076
<b>Output Class : Outputs Funded</b>	<b>0.780</b>	<b>0.000</b>	<b>0.000</b>	<b>0.780</b>	<b>1.844</b>	<b>0.000</b>	<b>1.844</b>
262 To international organisations	0.750	0.000	0.000	0.750	1.800	0.000	1.800

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264 To Resident Non-government units	0.030	0.000	0.000	0.030	0.044	0.000	0.044
<b>Output Class : Capital Purchases</b>	<b>17.691</b>	<b>0.000</b>	<b>0.000</b>	<b>17.691</b>	<b>18.623</b>	<b>0.000</b>	<b>18.623</b>
281 Property expenses other than interest	0.000	0.000	0.000	0.000	1.835	0.000	1.835
312 FIXED ASSETS	17.691	0.000	0.000	17.691	16.788	0.000	16.788
<b>Output Class : Arrears</b>	<b>0.114</b>	<b>0.000</b>	<b>0.000</b>	<b>0.114</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
321 DOMESTIC	0.114	0.000	0.000	0.114	0.000	0.000	0.000
<b>Grand Total :</b>	<b>62.468</b>	<b>0.000</b>	<b>7.146</b>	<b>69.614</b>	<b>81.432</b>	<b>0.000</b>	<b>81.432</b>
<b>Total excluding Arrears</b>	<b>62.354</b>	<b>0.000</b>	<b>7.146</b>	<b>69.500</b>	<b>81.432</b>	<b>0.000</b>	<b>81.432</b>

## VII. Budget By Programme And Subprogramme

Table V7.1: Past Expenditure Outturns and Medium Term Projections by Programme and SubProgramme

Billion Uganda shillings	FY 2017/18 Outturn	FY 2018/19		2019-20 Proposed Budget	Medium Term Projections			
		Approved Budget	Spent By End Dec		2020-21	2021-22	2022-23	2023-24
<b>51 Agricultural Research</b>	<b>100.714</b>	<b>69.614</b>	<b>19.969</b>	<b>81.432</b>	<b>93.359</b>	<b>99.087</b>	<b>105.784</b>	<b>113.635</b>
01 Headquarters	33.856	35.239	15.644	35.125	36.609	41.538	44.225	47.266
0382 Support for NARO	7.122	32.783	3.477	39.183	47.020	47.020	47.020	47.020
07 National Crops Resources Research Institute	0.092	0.201	0.155	0.654	0.600	0.650	0.900	1.200
08 National Fisheries Resources Research Institute	0.096	0.092	0.046	0.987	0.600	0.650	0.900	1.200
09 National Forestry Resources Research Institute	0.094	0.077	0.038	0.645	0.600	0.650	0.900	1.200
10 National Livestock Resources Research	0.099	0.092	0.046	0.180	0.600	0.650	0.900	1.200
11 National Semi arid Resources Research	0.099	0.078	0.039	0.080	0.600	0.650	0.900	1.200
1139 ATAAS (Grant) EU, WB and DANIDA Funded	45.540	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12 National Laboratories Research	0.110	0.106	0.053	0.297	0.600	0.650	0.900	1.200
13 Abi ZARDI	0.090	0.075	0.037	0.278	0.600	0.650	0.900	1.200
14 Bulindi ZARDI	0.086	0.083	0.039	0.488	0.600	0.650	0.900	1.200
15 Kachwekano ZARDI	0.090	0.090	0.045	0.475	0.600	0.650	0.900	1.200
16 Mukono ZARDI	0.082	0.086	0.043	0.475	0.600	0.650	0.900	1.200
17 Ngetta ZARDI	0.094	0.090	0.045	0.475	0.600	0.650	0.900	1.200
18 Nabium ZARDI	0.081	0.076	0.038	0.349	0.600	0.650	0.900	1.200
19 Mbarara ZARDI	0.090	0.079	0.039	0.475	0.600	0.650	0.900	1.200
20 Buginyaya ZARDI	0.094	0.105	0.053	0.480	0.600	0.650	0.900	1.200
21 Rwebitaba ZARDI	0.093	0.091	0.046	0.475	0.600	0.650	0.900	1.200
26 NARO Internal Audit	0.050	0.080	0.040	0.130	0.130	0.130	0.140	0.150
27 National Coffee Research Institute	0.086	0.091	0.046	0.180	0.600	0.650	0.900	1.200

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Total for the Vote	88.043	69.614	19.969	81.432	93.359	99.087	105.784	113.635
Total Excluding Arrears	88.036	69.500	19.859	81.432	93.359	99.087	105.784	113.635

## VIII. Programme Performance and Medium Term Plans

Table V8.1: Programme Outcome and Outcome Indicators ( Only applicable for FY 2019/20)

<b>Programme :</b>	51 Agricultural Research				
<b>Programme Objective :</b>	(1) Develop and promote demand-driven technologies, innovations and management practices that respond to target clientele demands; (2) Increase research products and services suited for vertical integration into industries; (3) Improve access and sustainable utilization of improved agricultural technologies and innovations by communities; (4) Reduce Total Factor Productivity to accelerate community institutional orientation to agricultural transformation.				
<b>Responsible Officer:</b>	Director General				
<b>Programme Outcome:</b>	Increased production and productivity of priority and strategic commodities				
<i>Sector Outcomes contributed to by the Programme Outcome</i>					
<b>1. Increased production and productivity of priority and strategic commodities</b>					
Outcome Indicators	Performance Targets				
			2019/20	2020/21	2021/22
	Baseline	Base year	Target	Projection	Projection
• Percentage of new varieties promoted and adopted by farmers and other users	12%	2018	12%	13%	14%
• Number of commercialisable technologies and innovations generated through competitive grant projects	0	2018	5	7	9
• Increased production and productivity at some level resulting from utilization of improved technologies	1.2%	2018	1.8%	2.4%	3.0%
<b>SubProgramme: 01 Headquarters</b>					
<i>Output: 01 Generation of agricultural technologies</i>					
No. of improved productivity technologies generated			60	30	30
No. of new varieties submitted to Variety Release Committee for release			15	15	15
No. of research studies under competitive grants scheme			19	20	20
<i>Output: 02 Research extension interface promoted and strengthened</i>					
No. of technological innovation platforms established/supported			20	20	20
No. of technological innovations delivered to uptake pathways			50	50	50
<b>SubProgramme: 07 National Crops Resources Research Institute</b>					
<i>Output: 01 Generation of agricultural technologies</i>					
No. of improved productivity technologies generated			8	8	8
No. of new varieties submitted to Variety Release Committee for release			5	5	5
<i>Output: 02 Research extension interface promoted and strengthened</i>					
No. of technological innovation platforms established/supported			3	5	5

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No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 08 National Fisheries Resources Research Institute</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	8	8	8
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 09 National Forestry Resources Research Institute</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	8	8	8
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	3	3	3
No. of technological innovations delivered to uptake pathways	5	5	5
<b>SubProgramme: 10 National Livestock Resources Research</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	8	8	8
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	5	5	5
No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 11 National Semi arid Resources Research</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	8	8	8
No. of new varieties submitted to Variety Release Committee for release	5	5	5
<b>SubProgramme: 12 National Laboratories Research</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	8	8	8
No. of new varieties submitted to Variety Release Committee for release	5	5	5
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	5	5	5
No. of technological innovations delivered to uptake pathways	5	5	5
<b>SubProgramme: 13 Abi ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	2	2	2



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No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 14 Bulindi ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	3	3	3
No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 15 Kachwekano ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
No. of new varieties submitted to Variety Release Committee for release	2	2	2
<b>SubProgramme: 16 Mukono ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
<b>SubProgramme: 17 Ngetta ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	2	2	2
No. of technological innovations delivered to uptake pathways	10	10	10
<b>SubProgramme: 18 Nabium ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
No. of new varieties submitted to Variety Release Committee for release	1		1
<i>Output: 02 Research extension interface promoted and strengthened</i>			
No. of technological innovation platforms established/supported	2	2	2
No. of technological innovations delivered to uptake pathways	5	5	5
<b>SubProgramme: 19 Mbarara ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	5	5	5
<b>SubProgramme: 20 Buginyaya ZARDI</b>			
<i>Output: 01 Generation of agricultural technologies</i>			
No. of improved productivity technologies generated	10	10	10
No. of new varieties submitted to Variety Release Committee for release	3		3

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<b>SubProgramme: 27 National Coffee Research Institute</b>			
<b>Output: 01 Generation of agricultural technologies</b>			
No. of improved productivity technologies generated	8	8	8
No. of new varieties submitted to Variety Release Committee for release	5		5
<b>Output: 02 Research extension interface promoted and strengthened</b>			
No. of technological innovation platforms established/supported	1	1	1
No. of technological innovations delivered to uptake pathways	5	5	5

## IX. Major Capital Investments And Changes In Resource Allocation

**Table 9.1: Major Capital Investment (Capital Purchases outputs over 0.5Billion)**

FY 2018/19		FY 2019/20
Appr. Budget and Planned Outputs	Expenditures and Achievements by end Dec	Proposed Budget and Planned Outputs
<b>Vote 142 National Agricultural Research Organisation</b>		
<b>Program : 01 51 Agricultural Research</b>		
Development Project : 0382 Support for NARO		
<b>Output: 01 51 72 Government Buildings and Administrative Infrastructure</b>		
Fully functional offices and farm infrastructure at Kiige. Fully functional plant genetic resources Lab. Functional Biotechnology and Food and Agribusiness laboratories at National Agricultural Research Laboratories (NARL). Habitable staff accomodation Habitable accommodation for guests. Habitable accommodation for staff. Infrastructure for livestock vaccine research and production developed and established Livestock research facilities relocated to Maruzi ranch, Apac district Research facilities (including staff housing) at NaSARRI for enhanced technology generation rehabilitated Research facilities (including staff housing) at NaSARRI for enhanced technology generation rehabilitated Research facilities (including staff housing) at Rwebitaba ZARDI for enhanced technology generation rehabilitated	Site Handed over, Work in progress Construction of PGRC Block. Site Handed over, Work in progress  Construction of Residential Staff Houses at NaCORRI-1 and NaCORRI-2 sites handed over, Work in progress. Renovation of Guest House at NaFORRI - Site Handed over, Work in progress. Rehabilitation of Residential Staff Accommodation - Site Handed over, Work in progress. Procurement Process concluded. Awaiting contracts committee clearance Procurement Process concluded. Awaiting contracts committee clearance Procurement to be advertised in Four Lots Rehabilitation of Office Block at NaSARRI - Procurement to be advertised in Four Lots. Procurement Process concluded. Awaiting contracts committee clearance	1. NACORI staff houses rehabilitated and habitable; 2. NACORI office blocks rehabilitated and functional; 1. NASARRI staff houses rehabilitated and habitable; 2. NASARRI office blocks rehabilitated and functional; 3. Drying yards/floors rehabilitated and functional; 4. Vehicle/equipment workshop rehabilitated and functional. 1. RWEBITABA ZARDI staff houses rehabilitated and habitable; 2. RWEBITABA ZARDI Office blocks rehabilitated; 3. RWEBITABA ZARDI drying yards/floors rehabilitated; 4. RWEBITABA ZARDI vehicle/equipment workshop rehabilitated. 1. Staff houses rehabilitated and habitable; 2. Office blocks rehabilitated and functional; Functional and rejuvenated PARIS Improved Infrastructure at Kajansi Improved value addition Infrastructure at Bulindi ZARDI Improved value addition Infrastructure at Nabuin Nabuin ZARDI perimeter fence in place, farm animals and field experiments secured NALIRRI fence in place and farm animals and field experiments secured
<b>Total Output Cost(Ushs Thousand)</b>	<b>10,507,615</b>	<b>0 12,924,293</b>
Gou Dev't:	10,507,615	0 12,924,293
Ext Fin:	0	0 0
A.I.A:	0	0 0

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## Output: 01 51 75 Purchase of Motor Vehicles and Other Transport Equipment

Four(4) motor vehicles procured. This will facilitate operations at the livestock research institute at Maruzi, and activities at the vaccine production facility at Nakyesasa-NaLIRRI.	Best Evaluated Notice to all bidders running prior to Solicitor Generals Clearance and signing.	Six vehicles new transport equipment
<b>Total Output Cost(Ushs Thousand)</b>	<b>1,460,000</b>	<b>0</b>
Gou Dev't:	1,460,000	0
Ext Fin:	0	0
A.I.A:	0	0

## Output: 01 51 76 Purchase of Office and ICT Equipment, including Software

- 15 Desktop computers, 3 Laptops, 2 Scanners and 1 Digital Camera, 1 Heavy duty photocopier, 1 Generator, 2 Lawn mowers, 1 Carpet cleaner & 1 Paper Shredder procured. - ICT Equipment for enhanced Internet connectivity. - Heavy duty photocopying machine procured - Solar lighting on Institute premises installed	- Pending delivery of two (2) Laptops. - Pending delivery and installation of Microsoft Windows Active Software. - 1 Heavy duty photocopier - Procurement Process concluded.Awaiting clearance from Solicitor General prior to Contract signature	3 Laptops, 4 computers and accessories, Upgrade Server and LAN, 2 Photocopiers, Upgrade Ms Dynamics, - Ponar Grab, Van Dorn Water Sampler, Cadmium copper column, Hand held portable pump, Portable multi probe purchased Computers (workstations), Firewall, UPSes, patchcodes, External Hard disc, internet data for ISP internet, modems, flash discs, external hard disks soft and hard ware Enhanced and unified NaFIRRI communication infrastructure (Internet, website, email,portals, Active directory, file services, replication and recovery services). NaFIRRI research developments shared on the different communication networks. LG air conditioner purchased (Rwebitaba)
1 PC. and Lab machinery. A Local Area Network (LAN), Internet connectivity and ICT harmonisation set up, maintained and secured. Laptops, printers and generator for Bugusege, Lawn mower procure	- The procurement process is still on going.	
Nabuin (Desk Top Computers core i7 , Printers, Uniinterruptible Power supply(UPS), Staff clock in machine, - Ngetta (computers, printers, laptop computers,photocopiers, scanners, lawn mowers and generator) - Rwebitaba (External Hard disc, intern NASARRI (15 Desktop computers, 3 Laptops, 2 Scanners). Abi (1 Desktop computers, 1 Laptops, 1 Scanners). Buginyanya ( LCD Projector, Generator 15KVA, Deep Freezer, Photocopier (3), Water Dispenser (1) Lawn Mowers (3). Mukono ZARDI (3 Desktop computers,		
<b>Total Output Cost(Ushs Thousand)</b>	<b>1,312,490</b>	<b>0</b>
Gou Dev't:	1,312,490	0
Ext Fin:	0	0
A.I.A:	0	0

## Output: 01 51 77 Purchase of Specialised Machinery & Equipment

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Assortment of fisheries research equipment procured.			
Assortment of research equipment procured.		Best Evaluated Notice to all bidders running	
Tanganyika Jack, Grease gun machine , Laboratory oven and		prior to Solicitor Generals Clearance and	
Lawn mowers/machines procured.		signing	
The wheel loader and grader procured			
			Assortment of value addition equipment for Abi ZARDI
			Assortment of value addition equipment for Bulindi ZARDI
			Assortment of value addition equipment for Nabuin ZARDI
			Assortment of value addition equipment for NACRRI
			Assortment of value addition equipment for NAFIRRI
			Assortment of value addition equipment for NAFORRI
			Assortment of value addition equipment for NALIRRI
			Assortment of value addition equipment for NARL-Kawanda
			Cage equipments and installation, tractor implements like Loader, Slasher, echo sounder ,radar, fire extinguishers, public address system,money counting machine and other water vessel purchased equipments
			Functional invitro fertilisation and semen processing equipment procured and installed
			Functional Marine vessel CORMORANT overhauled
			Functional solar system in place
			Irrigation equipment for one PARI
			New one tractor with implements
<b>Total Output Cost(Ushs Thousand)</b>	<b>4,155,894</b>	<b>0</b>	<b>2,715,738</b>
Gou Dev't:	4,155,894	0	2,715,738
Ext Fin:	0	0	0
A.I.A:	0	0	0

## X. Vote Challenges and Plans To Improve Performance

### Vote Challenges

- (1) Inability to effectively retain highly trained and specialized staff due to low remuneration;
- (2) Inadequate staffing level, to address the continuously changing research landscape, due to wage bill ceiling provided;
- (3) Delayed passage of the Biosafety bill into law;
- (4) Land grabbing, encroachment and reallocation;
- (5) Operating in a project rather than program budget support;
- (6) Timely response to effects and impacts of climate change and variability;
- (7) Dependence on donor leading to skewed research agenda.

### Plans to improve Vote Performance

- (1) Continue generation of novel technologies, innovations and management practices for agricultural transformation;
- (2) Strengthen processes for linking research products to industry/ commercialization of research products;
- (3) Intensifying research and extension interface for improved technology transfer and adoption;
- (4) Creating employment and wealth-generating opportunities from agriculture especially the youth;
- (5) Continuing to improve research infrastructure for accelerating availability of cutting edge science-based agricultural solutions;
- (6) Centralized lab facilities that respond to emergencies;
- (7) Accreditation and certification of NARO labs;
- (8) Generating internal revenues to support agricultural research;
- (9) Biotechnology products advancement.
- (10) Integrate ICT application in agricultural research and development.

## XI Off Budget Support

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**Table 11.1 Off-Budget Support by Sub-Programme**

N/A

## XII. Vote Cross Cutting Policy And Other Budgetary Issues

**Table 12.1: Cross- Cutting Policy Issues**

**Issue Type: HIV/AIDS**

<b>Objective :</b>	NARO will develop and promote food products and preservation methods to enhance nutrition deficiencies for the sick and vulnerable . The targets will include the vulnerable groups but not limited to resource poor women, youth and men in the farming communities.
<b>Issue of Concern :</b>	Appropriate and mitigative nutrition and labor saving technologies
<b>Planned Interventions :</b>	Generation of appropriate and responsive nutritive technologies and creation of awareness on HIV/AIDS among key NARO stakeholders
<b>Budget Allocation (Billion) :</b>	0.030
<b>Performance Indicators:</b>	No and types of initiatives

**Issue Type: Gender**

<b>Objective :</b>	NARO will main streaming gender within agricultural research service delivery while also generating gender-responsive, relevant and environmentally aligned novel technologies for various strata of users including urban population; increased production of early generation seed and prototypes; and increased technology incubation. This will target men, women, youth and the elderly members of the farming communities of Uganda.
<b>Issue of Concern :</b>	To mainstream gender concerns in agricultural research by (i) strengthening capacity of scientists in gender mainstreaming to address gender equity (ii) Conduct and screen research projects which are gender responsive
<b>Planned Interventions :</b>	Conduct gender responsive and gender compliant agricultural research agenda, service delivery and product delivery
<b>Budget Allocation (Billion) :</b>	0.050
<b>Performance Indicators:</b>	Number of scientists trained in gender equity; number of projects screened /analysed for gender concerns

**Issue Type: Environment**

<b>Objective :</b>	NARO will conduct and promote research in Livestock, Crops, Forestry, Fisheries, soil, land and water management while integrating environmental social Safeguards (ESSGs) in agricultural research and development.  NARO will contribute to policy formulation processes in Livestock, Crops, Forestry, Fisheries, soil, land and water management including but not limited to seed, fertilizer, genetic resources, and bio-safety.
<b>Issue of Concern :</b>	To generate technologies appropriate for environmental sustainability and mitigating the effects of environmental degradation and climate smart agriculture.
<b>Planned Interventions :</b>	Generate climate smart and sustainable land management technologies specific to agro ecological Zones with special focus on climate smart agriculture, market responsive agriculture and market smart agriculture
<b>Budget Allocation (Billion) :</b>	0.050

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**Performance Indicators:** (i) Number of climate smart and SLM projects implemented;  
(ii) Number of climate smart and SLM technologies generated and;  
(ii) Number of climate smart and SLM technologies demonstrated

## XIII. Personnel Information

**Table 13.1 Staff Establishment Analysis**

Title	Salary Scale	Number Of Approved Positions	Number Of Filled Positions
Database Management Officer	U5 (i)	1	1
Director General	UR 1(i)	1	1
Deputy Director General	UR 1(ii)	2	2
Director	UR 2(i)	16	16
Director Corporate Services	UR 2(i)	1	1
Business Development Manager	UR 2(ii)	1	1
National Coordinator CGS	UR 2(ii)	1	1
National Coordinator Invasive Species	UR 2(ii)	1	1
Senior Principal Research Officer	UR 2(ii)	5	2
Asst. Coordinator CGS	UR 3	1	1
Head Internal Audit	UR 3	1	1
Principal Administrative Assistant G.I	UR 3	1	1
Principal Finance Officer	UR 3	3	1
Principal Librarian/Documentation Officer	UR 3	1	1
Principal Monitoring & Evaluation Officer	UR 3	1	1
Principal Public Relations Officer	UR 3	1	1
Principal Research Officer	UR 3	10	8
Aquaculture Systems Design / Engineer	UR 4	1	1
Chief Technician	UR 4	20	1
Coordinator, Social Safeguard	UR 4	1	1
Council Secretary	UR 4	1	1
Marine Engineer	UR 4	1	1
Research Vessel / Ship Captain	UR 4	1	1
Senior Corporate Services Officer	UR 4	1	1
Senior Development Communication Officer	UR 4	6	6
Senior Finance Officer	UR 4	12	10
Senior Human Resource & Administrative Officer	UR 4	7	7

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Senior Incubation Officer	UR 4	1	1
Senior Information Communication Officer	UR 4	1	1
Senior Intellectual Property Rights Officer	UR 4	1	1
Senior Management Information Systems Officer	UR 4	1	1
Senior Outreach Officer	UR 4	1	1
Senior Systems Administrator	UR 4	1	1
Agri-Business Manager	UR 5(i)	2	2
Biometician/Statistician	UR 5(i)	2	2
Development Communication Officer Grade.I	UR 5(i)	6	6
Documentation Officer	UR 5(i)	1	1
Farm Manager	UR 5(i)	16	10
Finance Officer	UR 5(i)	10	10
Information Communication Officer	UR 5(i)	2	1
Internal Auditor	UR 5(i)	13	13
Planning, Monitoring & Evaluation Officer	UR 5(i)	5	5
Principal Technician	UR 5(i)	32	21
Publications Officer	UR 5(i)	1	1
Quality Assurance Officer	UR 5(i)	1	1
Records Officer	UR 5(i)	1	1
Research Officer	UR 5(i)	195	180
Senior Administration Assistant Grade.I	UR 5(i)	2	2
Senior Workshop Supretendant	UR 5(i)	1	1
Assistant Procurement Officer	UR 5(ii)	1	1
Assistant Systems Administrator	UR 5(ii)	8	7
Development Communication Officer G.II	UR 5(ii)	7	7
Procurement Officer	UR 5(ii)	16	15
Research Assistant	UR 5(ii)	15	15
Senior Accounts Assistant	UR 5(ii)	6	6
Senior Adminstrative Assistant Grade.II	UR 5(ii)	20	20
Senior Electrician	UR 5(ii)	1	1
Senior Marine Technician	UR 5(ii)	1	1
Senior Stores Assistant	UR 5(ii)	8	8

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Senior Technician	UR 5(ii)	74	55
Administrative Assistant	UR 6	14	11
Assistant Librarian	UR 6	1	1
ICT/Systems Assistant	UR 6	16	7
Machinist	UR 6	1	1
Marine Technologist	UR 6	1	1
Records Assistant Grade.I	UR 6	1	1
Stores Assistant	UR 6	11	11
Carpenter	UR 7	1	1
Cashier	UR 7	1	1
Deck Hand Grade I	UR 7	1	1
Electrician	UR 7	2	2
Head Office Assistant	UR 7	1	1
Mechanic	UR 7	1	1
Plumber	UR 7	2	2
Records Assistant Grade.II	UR 7	2	2
Tool Operator	UR 7	1	1
Typist Cum Clerk	UR 7	3	3
Assistant Plumber	UR 8	1	1
Deck Hand Grade II	UR 8	1	1
Labaratory Attendant	UR 8	1	1
Nursery Attendant	UR 8	3	3
Office Messenger	UR 8	19	18
Security Guard	UR 8	35	35
Senior Knowledge Management Officer	UR4	1	1
Senior Research Officer	UR4	58	55
Technician	UR6	149	99
Driver	UR7	89	89

**Table 13.2 Staff Recruitment Plan**

Post Title	Salary Scale	No. Of Approved Posts	No Of Filled Posts	Vacant Posts	No. of Posts Cleared for Filling FY2019/20	Gross Salary Per Month (UGX)	Total Annual Salary (UGX)
Administrative Assistant	UR 6	14	11	3	1	1,287,520	15,450,240
Agri-Business Manager	UR 5(i)	2	2	0	0	0	0
Aquaculture Systems Design / Engineer	UR 4	1	1	0	0	0	0
Assistant Librarian	UR 6	1	1	0	0	0	0



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Assistant Plumber	UR 8	1	1	0	0	0	0
Assistant Procurement Officer	UR 5(ii)	1	1	0	0	0	0
Assistant Systems Administrator	UR 5(ii)	8	7	1	1	1,581,873	18,982,476
Asst. Coordinator CGS	UR 3	1	1	0	0	0	0
Biometrician/Statistician	UR 5(i)	2	2	0	0	0	0
Business Development Manager	UR 2(ii)	1	1	0	0	0	0
Carpenter	UR 7	1	1	0	0	0	0
Cashier	UR 7	1	1	0	0	0	0
Chief Technician	UR 4	20	1	19	19	56,796,187	681,554,244
Coordinator, Social Safeguard	UR 4	1	1	0	0	0	0
Council Secretary	UR 4	1	1	0	0	0	0
Database Management Officer	U5 (i)	1	1	0	0	0	0
Deck Hand Grade I	UR 7	1	1	0	0	0	0
Deck Hand Grade II	UR 8	1	1	0	0	0	0
Deputy Director General	UR 1(ii)	2	2	0	-3	-27,335,055	-328,020,660
Development Communication Officer G.II	UR 5(ii)	7	7	0	0	0	0
Development Communication Officer Grade.I	UR 5(i)	6	6	0	0	0	0
Director	UR 2(i)	16	16	0	0	0	0
Director Corporate Services	UR 2(i)	1	1	0	0	0	0
Director General	UR 1(i)	1	1	0	0	0	0
Documentation Officer	UR 5(i)	1	1	0	0	0	0
Driver	UR7	89	89	0	0	0	0
Electrician	UR 7	2	2	0	0	0	0
Farm Manager	UR 5(i)	16	10	6	1	2,242,705	26,912,460
Finance Officer	UR 5(i)	10	10	0	0	0	0
Head Internal Audit	UR 3	1	1	0	0	0	0
Head Office Assistant	UR 7	1	1	0	0	0	0
ICT/Systems Assistant	UR 6	16	7	9	1	1,287,520	15,450,240
Information Communication Officer	UR 5(i)	2	1	1	1	2,242,705	26,912,460
Internal Auditor	UR 5(i)	13	13	0	0	0	0
Labaratory Attendant	UR 8	1	1	0	0	0	0
Machinist	UR 6	1	1	0	0	0	0
Marine Engineer	UR 4	1	1	0	0	0	0
Marine Technologist	UR 6	1	1	0	0	0	0
Mechanic	UR 7	1	1	0	0	0	0
National Coordinator CGS	UR 2(ii)	1	1	0	0	0	0
National Coordinator Invasive Species	UR 2(ii)	1	1	0	0	0	0
Nursery Attendant	UR 8	3	3	0	0	0	0
Office Messenger	UR 8	19	18	1	1	803,811	9,645,732
Planning, Monitoring & Evaluation Officer	UR 5(i)	5	5	0	0	0	0
Plumber	UR 7	2	2	0	0	0	0
Principal Administrative Assistant G.I	UR 3	1	1	0	0	0	0

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Principal Finance Officer	UR 3	3	1	2	1	3,575,402	42,904,824
Principal Librarian/Documentation Officer	UR 3	1	1	0	0	0	0
Principal Monitoring & Evaluation Officer	UR 3	1	1	0	0	0	0
Principal Public Relations Officer	UR 3	1	1	0	0	0	0
Principal Research Officer	UR 3	10	8	2	2	8,504,246	102,050,952
Principal Technician	UR 5(i)	32	21	11	11	23,321,804	279,861,648
Procurement Officer	UR 5(ii)	16	15	1	1	2,138,823	25,665,876
Publications Officer	UR 5(i)	1	1	0	0	0	0
Quality Assurance Officer	UR 5(i)	1	1	0	0	0	0
Records Assistant Grade.I	UR 6	1	1	0	0	0	0
Records Assistant Grade.II	UR 7	2	2	0	0	0	0
Records Officer	UR 5(i)	1	1	0	0	0	0
Research Assistant	UR 5(ii)	15	15	0	0	0	0
Research Officer	UR 5(i)	195	180	15	10	21,388,230	256,658,760
Research Vessel / Ship Captain	UR 4	1	1	0	0	0	0
Security Guard	UR 8	35	35	0	0	0	0
Senior Accounts Assistant	UR 5(ii)	6	6	0	0	0	0
Senior Administration Assistant Grade.I	UR 5(i)	2	2	0	0	0	0
Senior Administrative Assistant Grade.II	UR 5(ii)	20	20	0	0	0	0
Senior Corporate Services Officer	UR 4	1	1	0	0	0	0
Senior Development Communication Officer	UR 4	6	6	0	0	0	0
Senior Electrician	UR 5(ii)	1	1	0	0	0	0
Senior Finance Officer	UR 4	12	10	2	2	5,978,546	71,742,552
Senior Human Resource & Administrative Officer	UR 4	7	7	0	0	0	0
Senior Incubation Officer	UR 4	1	1	0	0	0	0
Senior Information Communication Officer	UR 4	1	1	0	0	0	0
Senior Intellectual Property Rights Officer	UR 4	1	1	0	0	0	0
Senior Knowledge Management Officer	UR4	1	1	0	0	0	0
Senior Management Information Systems Officer	UR 4	1	1	0	0	0	0
Senior Marine Technician	UR 5(ii)	1	1	0	0	0	0
Senior Outreach Officer	UR 4	1	1	0	0	0	0
Senior Principal Research Officer	UR 2(ii)	5	2	3	3	16,170,129	194,041,548
Senior Research Officer	UR4	58	55	3	3	7,730,433	92,765,196
Senior Stores Assistant	UR 5(ii)	8	8	0	0	0	0
Senior Systems Administrator	UR 4	1	1	0	0	0	0
Senior Technician	UR 5(ii)	74	55	19	19	30,055,587	360,667,044
Senior Workshop Supretendant	UR 5(i)	1	1	0	0	0	0
Stores Assistant	UR 6	11	11	0	0	0	0
Technician	UR6	149	99	50	50	58,523,650	702,283,800
Tool Operator	UR 7	1	1	0	0	0	0

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Typist Cum Clerk	UR 7	3	3	0	0	0	0
<b>Total</b>		969	821	148	124	216,294,116	2,595,529,392